THERMAL ARC®

A THERMADYNE® Company

Model TA-10/270 H

PREDATOR

AC/DC CC/CV Welding Generator

STICK
MIG
AUXILIARY POWER

Service Manual

4/1/02

Manual No. 430429-493

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SECTION 1: GENERAL INFORMATION

1.01 Notes, Cautions and Warnings

Throughout this manual, notes, cautions, and warnings are used to highlight important information. These highlights are categorized as follows:

NOTE

An operation, procedure, or background information which requires additional emphasis or is helpful in efficient operation of the system.

CAUTION

A procedure which, if not properly followed, may cause damage to the equipment.

WARNING

A procedure which, if not properly followed, may cause injury to the operator or others in the operating area.

1.02 Important Safety Precautions

WARNING

OPERATION AND MAINTENANCE OF ARC WELDING EQUIPMENT CAN BE DANGEROUS AND HAZARDOUS TO YOUR HEALTH.

To prevent possible injury, read, understand and follow all warnings, safety precautions and instructions before using the equipment. Call 1-603-298-5711 or your local distributor if you have any questions.

GASES AND FUMES

Gases and fumes produced during the Arc welding/cutting process can be dangerous and hazardous to your health.

- Keep all fumes and gases from the breathing area. Keep your head out of the welding fume plume.
- Use an air-supplied respirator if ventilation is not adequate to remove all fumes and gases.
- The kinds of fumes and gases from the arc welding/cutting depend on the kind of metal being used, coatings on the metal, and the different processes. You must be very careful when cutting or welding any metals which may contain one or more of the following:

Antimony	Chromium	Mercury
Arsenic	Cobalt	Nickel
Barium	Copper	Selenium
Beryllium	Lead	Silver
Cadmium	Manganese	Vanadium

- Always read the Material Safety Data Sheets (MSDS) that should be supplied with the material you are using. These MSDSs will give you the information regarding the kind and amount of fumes and gases that may be dangerous to your health.
- For information on how to test for fumes and gases in your workplace, refer to item 1 in Subsection 1.03, Publications in this manual.
- Use special equipment, such as water or down draft welding/cutting tables, to capture fumes and gases.
- Do not use the welding torch in an area where combustible or explosive gases or materials are located.
- Phosgene, a toxic gas, is generated from the vapors of chlorinated solvents and cleansers. Remove all sources of these vapors.

ELECTRIC SHOCK

Electric Shock can injure or kill. The arc welding process uses and produces high voltage electrical energy. This electric energy can cause severe or fatal shock to the operator or others in the workplace.

- Never touch any parts that are electrically “live” or “hot.”
- Wear dry gloves and clothing. Insulate yourself from the work piece or other parts of the welding circuit.
- Repair or replace all worn or damaged parts.
- Extra care must be taken when the workplace is moist or damp.
- Install and maintain equipment according to NEC code, refer to item 4 in Subsection 1.03, Publications.
- Disconnect power source before performing any service or repairs.
- Read and follow all the instructions in the Operating Manual.

FIRE AND EXPLOSION

Fire and explosion can be caused by hot slag, sparks, or the arc weld.

- Be sure there is no combustible or flammable material in the workplace. Any material that cannot be removed must be protected.
- Ventilate all flammable or explosive vapors from the workplace.
- Do not cut or weld on containers that may have held combustibles.
- Provide a fire watch when working in an area where fire hazards may exist.
- Hydrogen gas may be formed and trapped under aluminum workpieces when they are cut underwater or while using a water table. **DO NOT** cut aluminum alloys underwater or on a water table unless the hydrogen gas can be eliminated or dissipated. Trapped hydrogen gas that is ignited will cause an explosion.

NOISE

Noise can cause permanent hearing loss. Arc welding/cutting processes can cause noise levels to exceed safe limits. You must protect your ears from loud noise to prevent permanent loss of hearing.

- To protect your hearing from loud noise, wear protective ear plugs and/or ear muffs. Protect others in the workplace.
- Noise levels should be measured to be sure the decibels (sound) do not exceed safe levels.
- For information on how to test for noise, see item 1 in Subsection 1.03, Publications, in this manual.

ARC WELDING RAYS

Arc Welding/Cutting Rays can injure your eyes and burn your skin. The arc welding/cutting process produces very bright ultra violet and infra red light. These arc rays will damage your eyes and burn your skin if you are not properly protected.

- To protect your eyes, always wear a welding helmet or shield. Also always wear safety glasses with side shields, goggles or other protective eye wear.
- Wear welding gloves and suitable clothing to protect your skin from the arc rays and sparks.
- Keep helmet and safety glasses in good condition. Replace lenses when cracked, chipped or dirty.
- Protect others in the work area from the arc rays. Use protective booths, screens or shields.
- Use the shade of lens as recommended in Subsection 1.03, item 4.

1.03 Publications

Refer to the following standards or their latest revisions for more information:

1. OSHA, SAFETY AND HEALTH STANDARDS, 29CFR 1910, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
2. ANSI Standard Z49.1, SAFETY IN WELDING AND CUTTING, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
3. NIOSH, SAFETY AND HEALTH IN ARC WELDING AND GAS WELDING AND CUTTING, obtainable from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
4. ANSI Standard Z87.1, SAFE PRACTICES FOR OCCUPATION AND EDUCATIONAL EYE AND FACE PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
5. ANSI Standard Z41.1, STANDARD FOR MEN'S SAFETY-TOE FOOTWEAR, obtainable from the American National Standards Institute, 1430 Broadway, New York, NY 10018
6. ANSI Standard Z49.2, FIRE PREVENTION IN THE USE OF CUTTING AND WELDING PROCESSES, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018
7. AWS Standard A6.0, WELDING AND CUTTING CONTAINERS WHICH HAVE HELD COMBUSTIBLES, obtainable from American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
8. NFPA Standard 51, OXYGEN-FUEL GAS SYSTEMS FOR WELDING, CUTTING AND ALLIED PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
9. NFPA Standard 70, NATIONAL ELECTRICAL CODE, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
10. NFPA Standard 51B, CUTTING AND WELDING PROCESSES, obtainable from the National Fire Protection Association, Batterymarch Park, Quincy, MA 02269

11. CGA Pamphlet P-1, SAFE HANDLING OF COMPRESSED GASES IN CYLINDERS, obtainable from the Compressed Gas Association, 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202
12. CSA Standard W117.2, CODE FOR SAFETY IN WELDING AND CUTTING, obtainable from the Canadian Standards Association, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada M9W 1R3
13. NWSA booklet, WELDING SAFETY BIBLIOGRAPHY obtainable from the National Welding Supply Association, 1900 Arch Street, Philadelphia, PA 19103
14. American Welding Society Standard AWSF4.1, RECOMMENDED SAFE PRACTICES FOR THE PREPARATION FOR WELDING AND CUTTING OF CONTAINERS AND PIPING THAT HAVE HELD HAZARDOUS SUBSTANCES, obtainable from the American Welding Society, 550 N.W. LeJeune Rd, Miami, FL 33126
15. ANSI Standard Z88.2, PRACTICE FOR RESPIRATORY PROTECTION, obtainable from American National Standards Institute, 1430 Broadway, New York, NY 10018

1.04 Note, Attention et Avertissement

Dans ce manuel, les mots “note,” “attention,” et “avertissement” sont utilisés pour mettre en relief des informations à caractère important. Ces mises en relief sont classifiées comme suit :

NOTE

Toute opération, procédure ou renseignement général sur lequel il importe d’insister davantage ou qui contribue à l’efficacité de fonctionnement du système.

ATTENTION

Toute procédure pouvant résulter l’endommagement du matériel en cas de non-respect de la procédure en question.

AVERTISSEMENT

Toute procédure pouvant provoquer des blessures de l’opérateur ou des autres personnes se trouvant dans la zone de travail en cas de non-respect de la procédure en question.

1.05 Precautions De Securite Importantes

AVERTISSEMENT

L’OPÉRATION ET LA MAINTENANCE DU MATÉRIEL DE SOUDAGE À L’ARC AU JET DE PLASMA PEUVENT PRÉSENTER DES RISQUES ET DES DANGERS DE SANTÉ.

Il faut communiquer aux opérateurs et au personnel TOUS les dangers possibles. Afin d’éviter les blessures possibles, lisez, comprenez et suivez tous les avertissements, toutes les précautions de sécurité et toutes les consignes avant d’utiliser le matériel. Composez le + 603-298-5711 ou votre distributeur local si vous avez des questions.

FUMÉE et GAZ

La fumée et les gaz produits par le procédé de jet de plasma peuvent présenter des risques et des dangers de santé.

- Eloignez toute fumée et gaz de votre zone de respiration. Gardez votre tête hors de la plume de fumée provenant du chalumeau.
- Utilisez un appareil respiratoire à alimentation en air si l’aération fournie ne permet pas d’éliminer la fumée et les gaz.
- Les sortes de gaz et de fumée provenant de l’arc de plasma dépendent du genre de métal utilisé, des revêtements se trouvant sur le métal et des différents procédés. Vous devez prendre soin lorsque vous coupez ou soudez tout métal pouvant contenir un ou plusieurs des éléments suivants:

antimoine	cadmium	mercure
argent	chrome	nickel
arsenic	cobalt	plomb
baryum	cuivre	sélénium
béryllium	manganèse	vanadium

- Lisez toujours les fiches de données sur la sécurité des matières (sigle américain “MSDS”); celles-ci devraient être fournies avec le matériel que vous utilisez. Les MSDS contiennent des renseignements quant à la quantité et la nature de la fumée et des gaz pouvant poser des dangers de santé.

- Pour des informations sur la manière de tester la fumée et les gaz de votre lieu de travail, consultez l'article 1 et les documents cités à la page 5.
- Utilisez un équipement spécial tel que des tables de coupe à débit d'eau ou à courant descendant pour capter la fumée et les gaz.
- N'utilisez pas le chalumeau au jet de plasma dans une zone où se trouvent des matières ou des gaz combustibles ou explosifs.
- Le phosgène, un gaz toxique, est généré par la fumée provenant des solvants et des produits de nettoyage chlorés. Eliminez toute source de telle fumée.

CHOC ELECTRIQUE

Les chocs électriques peuvent blesser ou même tuer. Le procédé au jet de plasma requiert et produit de l'énergie électrique haute tension. Cette énergie électrique peut produire des chocs graves, voire mortels, pour l'opérateur et les autres personnes sur le lieu de travail.

- Ne touchez jamais une pièce "sous tension" ou "vive"; portez des gants et des vêtements secs. Isolez-vous de la pièce de travail ou des autres parties du circuit de soudage.
- Réparez ou remplacez toute pièce usée ou endommagée.
- Prenez des soins particuliers lorsque la zone de travail est humide ou moite.
- Montez et maintenez le matériel conformément au Code électrique national des Etats-Unis. (Voir la page 5, article 9.)
- Débranchez l'alimentation électrique avant tout travail d'entretien ou de réparation.
- Lisez et respectez toutes les consignes du Manuel de consignes.

INCENDIE ET EXPLOSION

Les incendies et les explosions peuvent résulter des scories chaudes, des étincelles ou de l'arc de plasma. Le procédé à l'arc de plasma produit du métal, des étincelles, des scories chaudes pouvant mettre le feu aux matières combustibles ou provoquer l'explosion de fumées inflammables.

- Soyez certain qu'aucune matière combustible ou inflammable ne se trouve sur le lieu de travail. Protégez toute telle matière qu'il est impossible de retirer de la zone de travail.
- Procurez une bonne aération de toutes les fumées inflammables ou explosives.
- Ne coupez pas et ne soudez pas les conteneurs ayant pu renfermer des matières combustibles.
- Prévoyez une veille d'incendie lors de tout travail dans une zone présentant des dangers d'incendie.
- Le gas hydrogène peut se former ou s'accumuler sous les pièces de travail en aluminium lorsqu'elles sont coupées sous l'eau ou sur une table d'eau. NE PAS couper les alliages en aluminium sous l'eau ou sur une table d'eau à moins que le gas hydrogène peut s'échapper ou se dissiper. Le gas hydrogène accumulé explosera si enflammé.

RAYONS D'ARC DE PLASMA

Les rayons provenant de l'arc de plasma peuvent blesser vos yeux et brûler votre peau. Le procédé à l'arc de plasma produit une lumière infra-rouge et des rayons ultra-violets très forts. Ces rayons d'arc nuiront à vos yeux et brûleront votre peau si vous ne vous protégez pas correctement.

- Pour protéger vos yeux, portez toujours un casque ou un écran de soudeur. Portez toujours des lunettes de sécurité munies de parois latérales ou des lunettes de protection ou une autre sorte de protection oculaire.
- Portez des gants de soudeur et un vêtement protecteur approprié pour protéger votre peau contre les étincelles et les rayons de l'arc.
- Maintenez votre casque et vos lunettes de protection en bon état. Remplacez toute lentille sale ou comportant fissure ou rognure.
- Protégez les autres personnes se trouvant sur la zone de travail contre les rayons de l'arc en fournissant des cabines ou des écrans de protection.
- Respectez le teint de lentille recommandé dans le article 4, page 5.
- Hydrogen gas may be present under aluminum workpieces during the cutting process when being cut underwater or using a water table. DO NOT cut aluminum underwater or on a water table unless the hydrogen gas can be eliminated as the hydrogen gas may detonate.

BRUIT

Le bruit peut provoquer une perte permanente de l'ouïe. Les procédés de soudage à l'arc de plasma peuvent provoquer des niveaux sonores supérieurs aux limites normalement acceptables. Vous dú4ez vous protéger les oreilles contre les bruits forts afin d'éviter une perte permanente de l'ouïe.

- Pour protéger votre ouïe contre les bruits forts, portez des tampons protecteurs et/ou des protections auriculaires. Protégez également les autres personnes se trouvant sur le lieu de travail.
- Il faut mesurer les niveaux sonores afin d'assurer que les décibels (le bruit) ne dépassent pas les niveaux sûrs.
- Pour des renseignements sur la manière de tester le bruit, consultez l'article 1, page 5.

1.06 Documents De Reference

Consultez les normes suivantes ou les révisions les plus récentes ayant été faites à celles-ci pour de plus amples renseignements :

1. OSHA, NORMES DE SÉCURITÉ DU TRAVAIL ET DE PROTECTION DE LA SANTÉ, 29CFR 1910, disponible auprès du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
2. Norme ANSI Z49.1, LA SÉCURITÉ DES OPÉRATIONS DE COUPE ET DE SOUDAGE, disponible auprès de la Société Américaine de Soudage (American Welding Society), 550 N.W. LeJeune Rd., Miami, FL 33126
3. NIOSH, LA SÉCURITÉ ET LA SANTÉ LORS DES OPÉRATIONS DE COUPE ET DE SOUDAGE À L'ARC ET AU GAZ, disponible auprès du Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402
4. Norme ANSI Z87.1, PRATIQUES SURES POUR LA PROTECTION DES YEUX ET DU VISAGE AU TRAVAIL ET DANS LES ECOLES, disponible de l'Institut Américain des Normes Nationales (American National Standards Institute), 1430 Broadway, New York, NY 10018
5. Norme ANSI Z41.1, NORMES POUR LES CHAUSSURES PROTECTRICES, disponible auprès de l'American National Standards Institute, 1430 Broadway, New York, NY 10018
6. Norme ANSI Z49.2, PRÉVENTION DES INCENDIES LORS DE L'EMPLOI DE PROCÉDÉS DE COUPE ET DE SOUDAGE, disponible auprès de l'American National Standards Institute, 1430 Broadway, New York, NY 10018
7. Norme A6.0 de l'Association Américaine du Soudage (AWS), LE SOUDAGE ET LA COUPE DE CONTENEURS AYANT RENFERMÉ DES PRODUITS COMBUSTIBLES, disponible auprès de la American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126
8. Norme 51 de l'Association Américaine pour la Protection contre les Incendies (NFPA), LES SYSTEMES À GAZ AVEC ALIMENTATION EN OXYGENE POUR LE SOUDAGE, LA COUPE ET LES PROCÉDÉS ASSOCIÉS, disponible auprès de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
9. Norme 70 de la NFPA, CODE ELECTRIQUE NATIONAL, disponible auprès de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
10. Norme 51B de la NFPA, LES PROCÉDÉS DE COUPE ET DE SOUDAGE, disponible auprès de la National Fire Protection Association, Batterymarch Park, Quincy, MA 02269
11. Brochure GCA P-1, LA MANIPULATION SANS RISQUE DES GAZ COMPRIMÉS EN CYLINDRES, disponible auprès de l'Association des Gaz Comprimés (Compressed Gas Association), 1235 Jefferson Davis Highway, Suite 501, Arlington, VA 22202
12. Norme CSA W117.2, CODE DE SÉCURITÉ POUR LE SOUDAGE ET LA COUPE, disponible auprès de l'Association des Normes Canadiennes, Standards Sales, 178 Rexdale Boulevard, Rexdale, Ontario, Canada, M9W 1R3
13. ivret NWSA, BIBLIOGRAPHIE SUR LA SÉCURITÉ DU SOUDAGE, disponible auprès de l'Association Nationale de Fournitures de Soudage (National Welding Supply Association), 1900 Arch Street, Philadelphia, PA 19103
14. Norme AWSF4.1 de l'Association Américaine de Soudage, RECOMMANDATIONS DE PRATIQUES SURES POUR LA PRÉPARATION À LA COUPE ET AU SOUDAGE DE CONTENEURS ET TUYAUX AYANT RENFERMÉ DES PRODUITS DANGEREUX , disponible auprès de la American Welding Society, 550 N.W. LeJeune Rd., Miami, FL 33126
15. Norme ANSI Z88.2, PRATIQUES DE PROTECTION RESPIRATOIRE, disponible auprès de l'American National Standards Institute, 1430 Broadway, New York, NY 10018

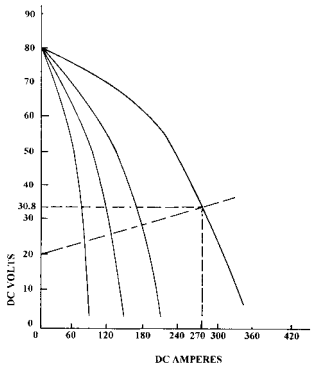
SECTION 2: TECHNICAL SPECIFICATIONS

2.01 Specifications

The Thermal Arc TA-10/270-H is a gasoline engine driven DC welding generator with selectable Constant Current (CC) and Constant Voltage (CV) output characteristics. This unit is designed for use with Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW), and GAS Tungsten Arc Welding - (GTAW) processes. A digital amperage/voltage meter is optional.

Specifications				
	AC	DC	Amperage Current Ranges	
Amperage Range	40 – 300	40 – 270	40 - 70	40 – 60
Duty Cycle	300 @ 60%	270 @ 60%	70 – 135	40 – 90
AC/DC welding current	250 @ 100%	250 @ 100%	155 – 240	90 – 170
Volt Range CV Mode	--	16 – 30	200 – 270	170 – 260
OCV CC Mode	100	100	260 – 300	220 – 270
Auxiliary Power				
Single Phase	115	2ea GFCI Duplex Receptacles 3.5Kva		
Single Phase	115/240	8.5Kva		
Three Phase	460	10Kva		
Engine				
Make/Type		HONDA	KOHLER	
Model series		GX 620 & 620K1	COMMAND 20	
Number of cylinders		2	2	
Displacement		614 cc.	614CC	
Power		20 HP	20HP	
Engine Speed		3750 rpm no load	3750 rpm no load	
Engine speed		2600 rpm Idle	2600 rpm Idle	
Cooling system		Air	Air	
Oil capacity		1.5 l. - 0,42 gl.	2.1 l – 0.56gl	
Fuel capacity		37.5 l. - 10 gl.	37.5 l – 10 gl	
Fuel consumption		5.2 l/h – 1.4 gl./Hr	5.2 l/Hr	
Battery		12V 340A	12V 340A	

2.02 Volt-Amp Curve



NOTE
Volt-ampere curves show the voltage and amperage output capabilities of the welding power source. Curves of other settings will fall between the curves shown.

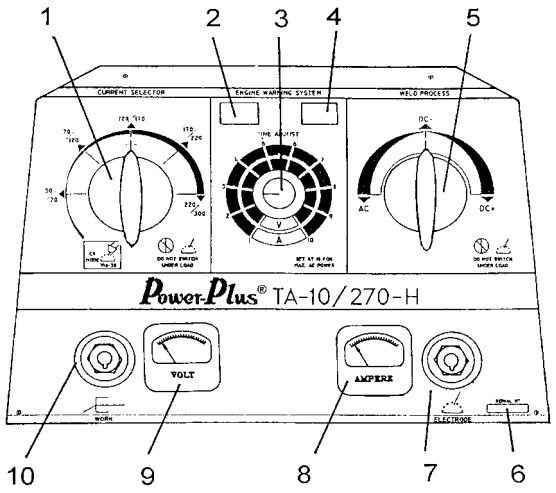
2.03 Duty Cycle

The duty cycle of a welding generator is the percentage of a ten-minute period that a welding generator can be operated at a given output without causing overheating and damaging of the unit. This unit is rated at 60 percent duty cycle when operated at 270 amperes. The unit can be operated at 270 amperes for six consecutive minutes, but it must operate at no load for the remaining four minutes to allow proper cooling. if the welding amperes decrease, the duty cycle increases. If

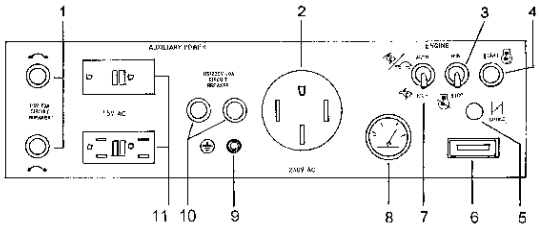
the welding amperes are increased beyond rated output, the duty cycle will decrease.

CAUTION: CONTINUAL EXCEEDING OF DUTY CYCLE RATINGS CAN CAUSE DAMAGE TO THE WELDING POWER SOURCE.

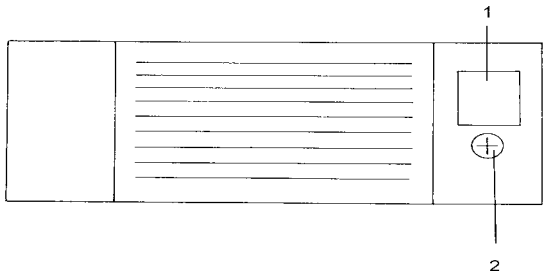
2.04 Front Panel Descriptions



1 Use to select welding current for CC mode and CV for MIG mode
2 Battery Charge Lamp-Should the charging circuit fail the Battery Charging Lamp will turn on and unit will turn off.
3 Fine adjustment-controls throttle for fine welding control of current CC and voltage CV Rotating this control in a clockwise direction increases the amperage or voltage output. The scale surrounding the control represents approximate actual amperage or voltage values.
4 Oil Level lamp-Should the oil sensor in the engine detect a low oil condition the Oil Level Lamp will turn on and engine will shut off.
5 Polarity switch-Sets welding polarity for DC Negative, DC Positive or AC.
6 Serial Number.
7 Welding Receptacle: Positive-Positive output welding connection for CC (Constant Current) and CV (Constant Voltage).
8 Amperage meter (optional).
9 Volt Meter (optional).
10 Welding Receptacle: Negative-Negative output welding connection for CC (Constant Current) STICK an TIG.



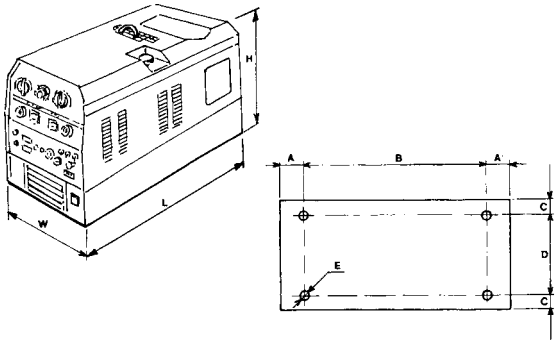
1 115V 20A Circuit Breakers – Push to reset. Controls 115V power source for the 115V duplex GFCI receptacles
2 230/115V Single Phase Receptacle - Supplies 60 Hz single-phase power at weld/power speed.
3 Engine RUN/STOP Switch – Place in the RUN position to operate generator. Use the START BUTTON to start engine. To shut off engine place switch in STOP position.
4 Start Button - Used to start the engine. Set the RUN/START switch to RUN, push START Button to start engine. When engine starts release button.
5 Choke – for easier starting.
6 Hour meter - Monitors Time in hours when the engine is on.
7 Engine: Auto/high switch – When in Auto the unit will idle until a load is applied. In High position the engine will operate above idle RPM.
8 Fuel Gauge - Monitors fuel level.
9 Earth Connection - used to earth ground the generator fot auxiliary power.
10 230/115V Circuit Breakers – Push to reset. Controls 230/115V power source for the 230/115V receptacle.
11 GFCI 115V Duplex Receptacles - Ground fault interrupt protection receptacle for 115V 60Hz power source.



1 Circuit breaker - 3 pole circuit breaker controls 460V three phase power source
2 460V Output - Access for three phase 460V 60 Hz connections. Connect Line1, 2 and 3 to the output side of the circuit breaker and the ground to the bolt mounted beside the circuit breaker

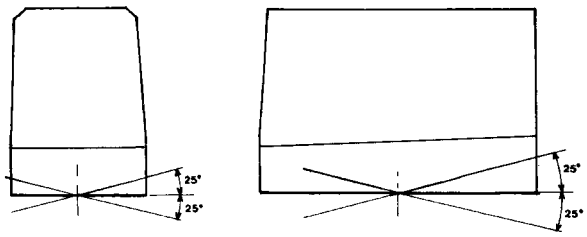
2.05 Dimensions and Weight

Height	710mm	27.9”
Width	**530mm**	**20.86”**
Length	**1080mm**	**42.52”**
A	**15mm**	**.59”**
B	**1050mm**	**41.34”**
C	**33mm**	**1.30”**
D	**424mm**	**16.69”**
E	**10.5mm Dia.**	**.41” Dia.**
Weight	**248 Kg**	**546.5 lb**



2.06 Maximum Welding Generator Operating Angles

Do not exceed operating angles while running or engine damage will occur.

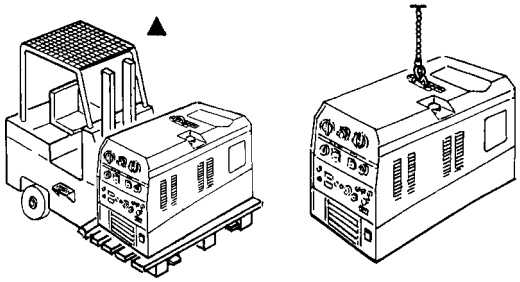


The operating angle is a maximum of 25 degrees.

2.07 Installing Welding Generator

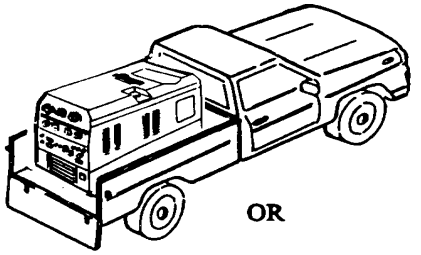
1) Lifting forks.
1) Lifting Eye. Use lifting eye or lifting forks to move unit. If using lifting forks, extend forks beyond opposite side of unit.
1) Trailer - Install unit on trailer according to trailer manufacturing.

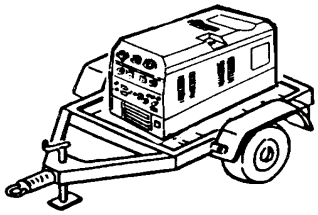
Movement - Do not lift unit from end.



2.08 Location

A proper installation site should be selected for the welding generator if the unit is to provide dependable service and remain relaticely maintenance free.

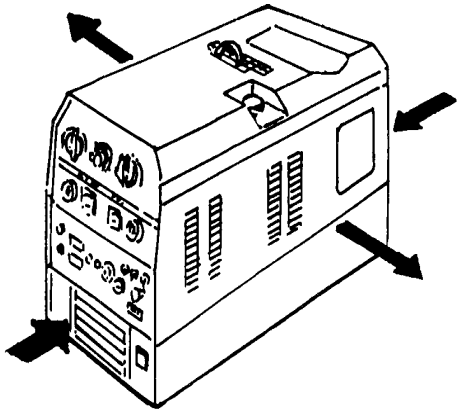




3

CAUTION: OPERATE IN OPEN, WELL VENTILATED AREAS, OR IF OPERATED INDOORS, VENT ENGINE EXHAUST OUTSIDE THE BUILDING. KEEP ENGINE EXHAUST OUTLET AWAY FROM BUILDING AIR INTAKES.

2.09 Air Flow Clearance

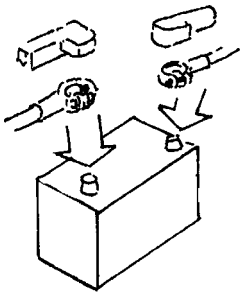


Maintain at least 19.7 inch (500mm) of unrestricted space on all sides of the unit, and keep underside free of obstructions.
Do not place any filtering device over the intake air passages of this welding generator. Warranty is void if any type of filtering device is used.

The service life and operating efficiency of this unit are reduced when the unit is subjected to high levels of dust, dirt, moisture, and corrosive vapors.

WARNING: SPARKS CAN CAUSE BATTERY GASES TO EXPLODE BATTERY ACID CAN BURN EYES AND SKIN.

- Stop engine before disconnecting or connecting battery cables.
- Always wear a faceshield and proper protective cloting when working on battery.
- Do not allow tools to cause sparks when working on a battery.
- Place the engine control switch in the STOP position.
- Remove bolts and pull out tray.
- Connect the cables
- Reinstall battery tray.



WARNING: ENGINE FUEL CAN CAUSE FIRE OR EXPLOSION.

- Stop engine before fueling.
- Do not fuel while smoking or near sparks or flames.
- Do not overfill tank-clean up any spilled fuel. REMOVE FUEL CAP SLOWLY-FUEL SPRAY MAY CAUSE INJURYFUEL MY BE UNDER PRESSURE. Rotate fuel cap slowly and wait until hissing stops before removing cap. Check all fluids daily. Engine must be cold and on a level surface. Add fresh fuel starting engine the first time.

2.10 Generator Auxiliary Power System

Standard Receptacles

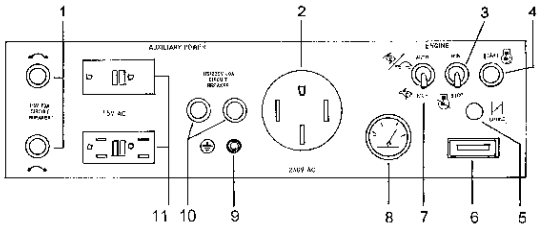
(1) Circuit breakers to protect (11) GFCI receptacles from overload.

(2) 240 V 50 A AC receptacle. Supplies 60 Hz single-phase power at maximum speed (3600 rpm). Maximum output is 8.5 kVA/kW.

(11) 120 V 15 A AC Duplex GFCI receptacle. Supplies 60 Hz single-phase power at maximum speed (3600 rpm). Maximum output each receptacle is 1.8 kVA/kW.

(10) Circuit breakers to protect (2) 240 V receptacle from overload.

(9) Earth ground connection.



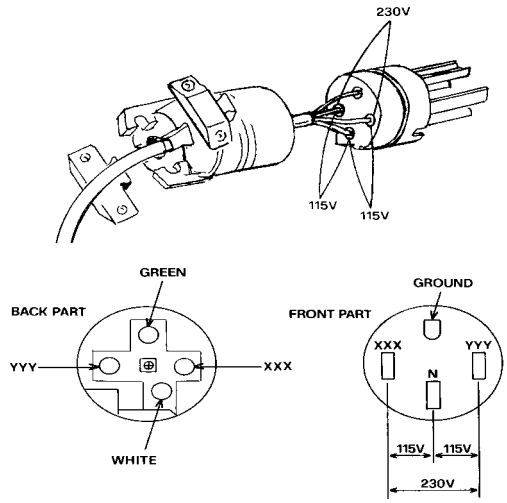
460 V 13 A AC three phase Circuit Breaker connection**.** Supplies 60 Hz three-phase power at maximum speed (3600 rpm). Maximum output is 10 kVA/kW.

To connect load remove the two retaining knobs holding the access panel. After opening the panel connect a cable to be used to supply the 460V three phase load to the three phase circuit breaker mounted to the access panel. Connected the ground cable to the bolt mounted next to the circuit breaker. Route the cable through the cable clamp and secure cable. Re-secure the access panel with the two retaining knobs to the front panel.

2.11 Wiring Optional 230 Volt Plug

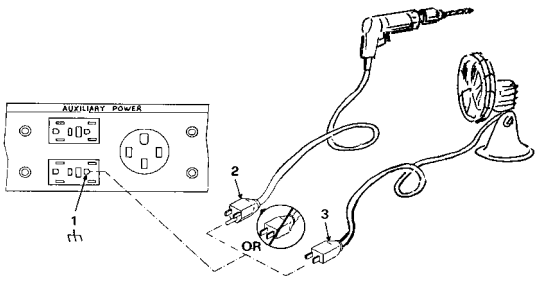
The plug can be wired for a 230V, 2-wire load or a 115/230V, 3-wire load. See diagram below

White - Neutral terminal.
YYY - Load 1 terminal.
XXX - Load 2 terminal.
Green - Ground terminal.



Select proper insolating and grounded equipment.

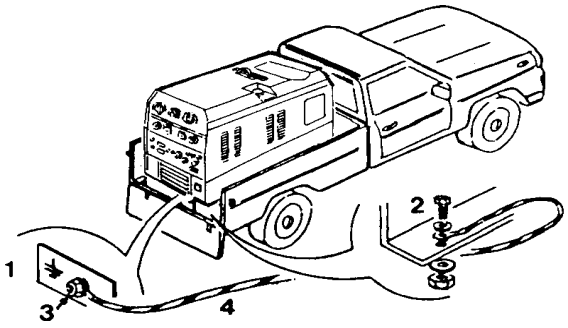
1) Auxiliary power receptacles are Neutral bonded to frame.
2) 3-Prong plug for case Grounded equipment
3) 2-Prong plug for double insulated equipment.



2.12 Grounding The Generator

TO A TRUCK OR TRAILER FRAME

1. Generator base.
2. Metal vehicle frame.
3. Equipment grounding terminal.
4. Grounding cable. Use # 10 AGW or larger insulated copper wire.

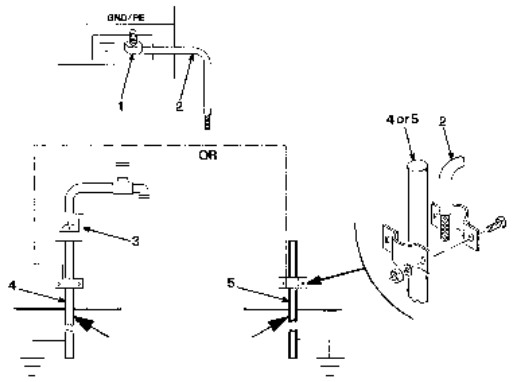


NOTE: FOR THE GFCI RECEPTACLES TO PERFORM PROPER PROTECTION THE WELDING GENERATOR MUST BE EARTH GROUNDED.

2.13 When Connecting To Home, Shop, or Farm Wiring

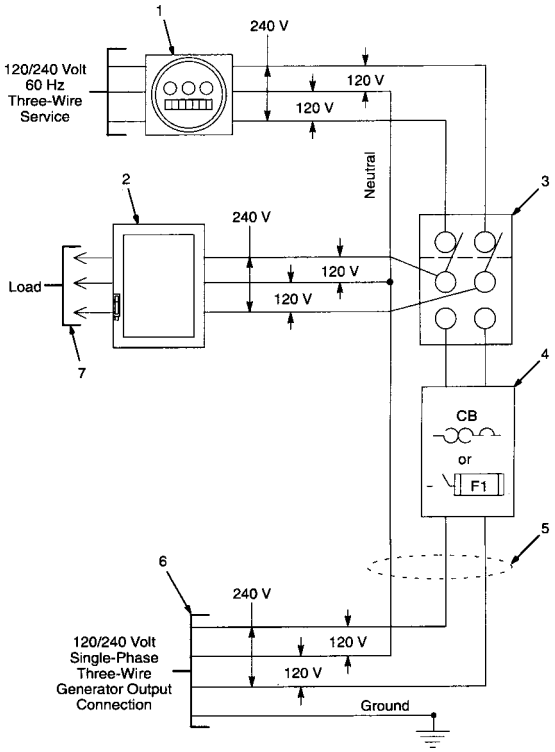
NOTE: THIS UNIT SHOULD NEVER BE USED AS THE MAIN SOURCE OF POWER.

1) Equipment grounding terminal.
1) Grounding cable. Use # 10 AGW or lager insulated copper wire.
1) Water meter.
1) Metal water pipe
1) Driven ground rod.



Typical connection to supply emergency or standby power.

1. Power Company Service Meter.
2. Main and Branch Over-current Protection.
3. Double-Pole, Double-Throw Transfer Switch. Obtain and install correct switch. Switch rating must be same as or greater than the branch over-current protection.
4. Circuit Breaker or Fused Disconnect Switch. Obtain and install correct switch.
5. Extension Cord. Select as shown in the Extension Cord Selection Chart.
6. Generator Connections. Connect terminals or plug of adequate amperage capacity to cord. Follow all applicable codes and safety practices. Turn off or unplug all equipment connected to generator before starting or stopping engine. When starting or stopping, the engine has low speed which causes low voltage and frequency.
7. Load connections.



Customer-supplied equipment is required if generator is to supply standby power during emergencies or power outages.

2.14 Auxiliary Power Requirements

The following section provides some general guidelines for the installation and operation of an auxiliary power generator. not all the guidelines may be applicable to this specific unit.

The auxiliary power supplied form the generator is most commonly used in industrial, small business and residential applications. For industrial applications, a portable unit can be moved the job site to power portable tools, lights, compressors, etc. For small business and residential applications, the generator supplies standby power during a power outage.

It is the installer's responsibility to follow all applicable codes when installing an auxiliary power generator. It is also the installer's responsibility to determine if the generator is capable of supplying adequate power for a specific application. When installing consult qualified local personnel and follow all applicable codes for safe and proper installation.

Before the generator may be used to supply power, the installer must first become familiar with and meet all codes applicable the installation of an auxiliary generator. It is the installer's responsibility to follow the applicable rules from the National Electrical Code (NEC), state, local, and OSHA codes for the installation and use of auxiliary power generators.

LOAD EVALUATION

Before connecting or operating the auxiliary power generator, the installer must determine if the generator in capable of supplying adequate power for a specific application. Load and generator evaluation is essential for satisfactory generator and equipment operation. See Power Requirements Table.

TYPES OF LOAD

Load requirements depend on the type of load connected to the generator. There are two types of loads, resistive and non-resistive. A resistive load, such as a light bulb, requires a constant amount of power from the generator. A non-resistive load, such as a portable grinder, requires variable amounts of power from the generator. Because a grinder requires more power for motor starting and is rarely used with a constant, even pressure, the load requirements can change greater than the operator anticipates.

RUNNING LOAD REQUIREMENTS

The total running load applied the generator is calculated by adding up all the individual loads. Some requirement is rated in amperes, others in watts. The requirements for most equipment are provided on its nameplate.

Example 1: If a drill requires 5 amperes at 115 volts, calculate its running power requirements in watts.

VOLTS x AMPERES = WATTS
115V x 5A = 575W
Therefor, the individual load applied by the drill is 575 watts.

Example 2: If a light bulb is rated at 200 watts, the individual load applied the light bulb is 200 watts. If three 200 watt light bulbs are used with the drill from example 1 add the individual loads to calculate total load.
(200W + 200W + 200W) + 575W = 1175W

Therefore the total load applied by the three light bulbs and drill is 1175 watts.

Motor-starting Requirements

Starting amperage requirements are many times the running amperage of the motor. Starting requirements must be determined to assure that the generator is capable of starting the motor without damaging it. This can be done by examining the motor nameplate and identifying the code letter specifying the starting kVA/HP required.

Motor Start Code Leter	KVA/HP
G	6.3
H	7.1
J	8.0
K	9.0
L	10.0
M	11.2
N	12.5
P	14.0

If the kVA/HP requirement, motor horsepower, and voltage rating are known, the starting amperage can be calculated.

Example: Calculate the starting amperage required for a 230V, ¼ HP motor with a motor start code of G.

Equation

$$\frac{\text{KVA/HP x HP x 1000}}{\text{VOLTS}} = \text{STARTING AMPERAGE}$$

Volts = 230
HP = ¼
Code G results in kVA/HP = 6.3

$$\frac{6.3 \times ¼ \times 1000}{230} = 6.85\text{A}$$

Therefore, starting the motor requires 6.85 amperes.

If a code letter is not present on the motor nameplate, approximate starting amperage is equal to six times running amperage. This is a reasonable approximation for all applications where the generator rated amperage is at least twice the motor requirement. If the generator-to-motor-size ratio is less than 2:1 acquire the needed information to properly determine the motor-starting requirement.

2.15 Simultaneous Welding and Power

(single or three phase)

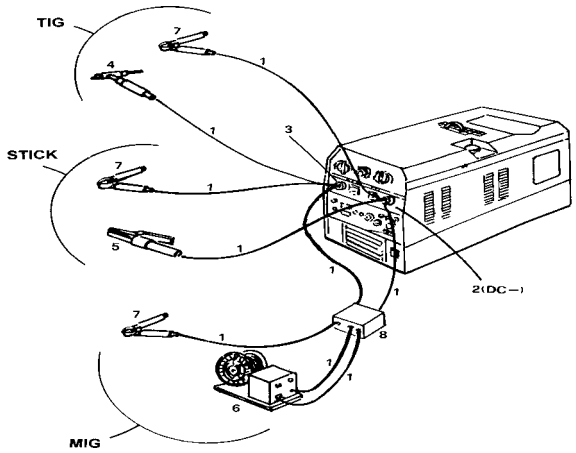
Weld Current	Total Power in Watts	120 volt GFCI Recept.	240 volt Recept. 8500 max.	460 volt Three phase
270A	1,200	10A	5A	1.5A
220A	3,660	15A x 2	15.25A	4.6A
170A	4,500	15A x 2	18.75A	5.65A
120A	7,000	15A x 2	29A	8.8A
70A	8,500	15A x 2	35.4A	10.68A
0A	10,000	15A x 2	35.4A	12.5A

Combined output of all receptacles limited to rating of the generator.

Example: If welding at 120A and 15A is drawn from the 120V GFCI duplex receptacle, 10A is drawn from the 240V receptacle, only 3.5A is available of 460V three-phase.

2.16 Selecting and Preparing Weld Output Cables

1) Weld output cable. Determine total cable length in weld circuit and maximum welding amperes. Use shortest cables possible. Do not use damaged cables.
1) Welding socket: negative connection.
1) Welding socket: positive connection. 2-3-4) Use lugs of proper amperage capacity and hole size for connecting to work clamp.
1) GTAW torch.
1) Insulated electrode holder..
1) Wire feeder. Install according to manufacturer's instruction.
1) Work clamp. Install onto work cable.
1) Interface conversion kit



TIPICAL PROCESS CONNECTIONS

SEQUENCE OF OPERATION

WARNING: Read end follow all safety precaution before proceeding with operation.

SHIELDED METAL ARC WELDING **(SMAW)**

1) Install and connect unit according to the installation section.
2) Wear gloves and clothing.
3) Connect work clamp at workplace.
4) Select proper electrode.
5) Place the selector switch in STICK position.
6) Place the OUTPUT CONTACTOR switch in ON position.
7) If remote amperage control is not used, place the Amperage/Voltage switch in panel position.
8) Rotate the Amperage/Voltage control, to desired position.
9) Insert electrode into electrode holder.

GAS TUNGSTEN ARC WELDING (GTAW) Scratch Start only

1) Install and connect unit according to the Installation section.
2) Select proper tungsten electrode.
3) Prepare tungsten electrode and insert the torch.
4) Wear gloves and clothing.
5) Connect work clamp to clean, bare metal at work place.
6) Place the process selector switch in Lift Tig position.
7) Place the Amperage/Voltage switch in desired position.
8) Rotate Amperage/Voltage control to desired position.
9) Turn on shielding gas and water supplies as applicable.
10) Place the Primary Power switch in ON position.
11) Touch electrode to work and lift to start arc.
12) Begin welding.

GAS METAL ARC WELDING (GMAW)

1) Install and connect unit.
2) Install and connect wire feed system.
3) Wear gloves and clothing.
4) Connect work clamp at workplace.
5) Place the process selector switch in MIG position.
6) Place the Amperage/Voltage switch in desired position.
7) Rotate Amperage/Voltage control to desired position.
8) Turn on shielding gas supply and set desired flow rate.
9) Place the Primary Power switch in ON position.
10) Begin welding.

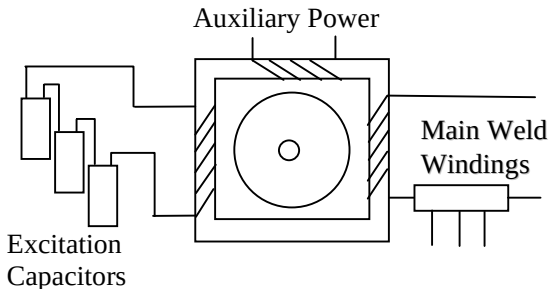
SELECTING WELD CABLE SIZES

Weld cable size (AWG) is based on either a 4 volts or less drop or a current density of more than 300 circular mils per ampere.

SECTION 3: TROUBLE SHOOTING GUIDE

The Predator is an asynchronous (brush-less) style generator. The basic theory of this style generator is as follows:

A permanent magnet (rotor) is rotating at a high speed inside a winding wrapped around a laminated steel core (stator). This produces a small voltage at a very low intensity, 1 to 2 volts at 1 amp in the exciter windings. This low voltage charges the excitation capacitors connected in series and directly connected to both ends of the exciter windings. This produces a charge-discharge situation that augments to the point at which it stabilizes itself in proportion to the magnetic force of the rotor winding wire's size and length, capacity of the capacitors, and engine speed (3600 rpm) at about 60 times per second. The Charge-discharge effect produces a collapsing of magnetic field in the laminated steel, thus creating a current all of its own. This current produced is proportional to the main winding characteristics, size, lengh, etc.



3.01 There Is No Auxiliary Voltage and/or Welding Current

In examining this particular fault it must be remembered that a asynchronous generator with excitation by capacitors has the valuable characteristic of becoming automatically de-energized while it is functioning (no longer supplies current) and of not becoming self-excited when it is started up if there is a short-circuit whether outside of the generator (in the user circuit) or inside it (in the windings and in the control equipment).

TROUBLE	POSSIBLE CAUSE	REMEDY
The GFCI is open or when actuated in the closed position it suddenly spring open.	The reset of the G.F.C.I. must be in the closed position. Check that the user circuit does not have a phase to earth.	Close the GFCI and disconnect the plugs from the current sockets. If the GFCI does not remain closed even if the reset is slowly closed, this means that the GFCI is faulty and that it must replaced.
The generator is connected to the maximum load, in particular induction motors.	When starting, the current plugs should not be connected directly with the load, but with a switch interposed that will allow the set to be started with the load disconnected.	Remove the load in the starting phase; if necesasry, disconnected the plugs from the current sockets. If generator still does not generate welding current refer to test section for exciter capacitors & Stator.
The + and - welding cables are in short-circuit through electric contact between them.	The electrode & Work lead are connected in short circuit condition.	Disconnect electrode & Work leads. If generator still does not generate welding current refer to test section for exciter capacitors & Stator.
Excitation Capacitors are shorted.	Disconnect the capacitors from the generator and from the equipment. Refer to test section for excitation capacitors.	If necessary, replace the capacitors.
Output welding receptacles loose or shorted.	Check the cable connections to the receptacles adjacent insulating are not been burnt or loose.	Replace the receptacle parts necessary.
Output Welding Rectifier is shorted.	With a tester check the diodes in the rectifier as shown in troubleshooting guide.	Replace the rectifier assembly if necessary.

The winding of the generator or components of the equipment are shorted to ground.	Disconnect the case ground connections and using a VOM check all components for a short to ground.	Refer to the Troubleshooting Guide for detailed component testing.

3.02 The Generator Is De-Energized when Load is connected

PROBABLE CAUSE	CONTROLS	REMEDIES
There is a short-circuit on the user circuit.	Check the load for shorts	Repair load circuit.
Excessive overload; induction motors (especially 2-poll) connected of higher power than the Generators specifications.	See that the induction motors are not of higher power than the specification of the generator.	Reduce load to within the specifications of the generator.

3.03 Excessive Fall of Voltage When The Load is Connected

PROBABLE CAUSE	CONTROLS	REMEDIES
The engine does not maintain the nominal speed.	Check whether the fine current control is functioning.	Replace or repair Fine Current control assembly.
	Check engine fuel system.	Refer to Engine manual for testing fuel system.
	Check with an ammeter whether the load is greater than the rated load of the generator.	Reduce load to within generator specifications.

3.04 Single Phase Receptacle Out Of Balance When at Idling

PROBABLE CAUSE	CONTROLS	REMEDIES
A capacitor of one phase is disconnected or is no longer working properly.	Check the connections at the terminals of the capacitors. See capacitor testing in the the Troubleshooting Guide.	Repair the faulty capacitor connections. Replace any capacitor that may be found to be defective.

3.05 Insufficient Welding Current

PROBABLE CAUSE	CONTROLS	REMEDIES
The engine does not obtain maximum speed.	Check the Fine Current Control function.	Repair or replace the Fine Current Control.
	Check engine throttle linkage, Fuel and electrical systems.	Refer to engine manual.
One phase on the capacitors or on the rectifiers is disconnected.	Check that all the internal connections have a sound electrical connection.	Fix any connections that may have worked loose.
Faulty winding in stator.	Check stator according to Stator section in troubleshooting guide.	Replace stator if necessary

3.06 The Battery Runs down Frequently

PROBABLE CAUSE	CONTROLS	REMEDIES
Battery defective: does not maintain the load.	Check for shorted battery cell.	Replace battery.
Engine charge circuit defective	Test charge circuit according to engine manual.	

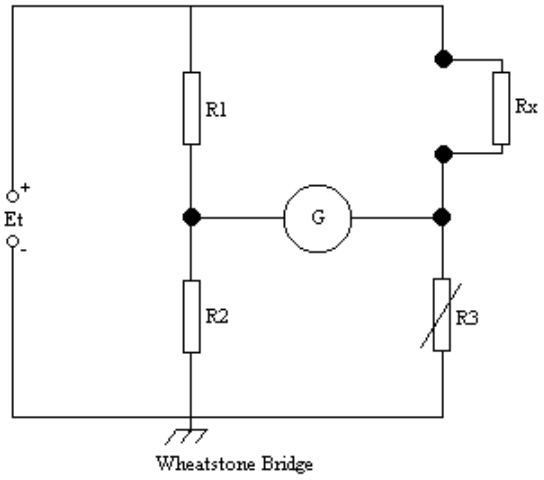
SECTION 4: CIRCUIT TESTING

4.01 Checking the Resistance of the Stator Windings

Check the generator stator for a short between the auxiliary power and weld stator by selecting the AC weld mode of operation. Check the resistance from the frame ground to the work weld output terminal. There should be an open between these two windings. If you measure a low resistance the stator needs to be replaced.

NOTE: On units with serial number older that T91811A191707C, it will be necessary to disconnect the cable connected between the work output terminal and frame ground.

To check the stator for a winding to winding short, it requires a low resistance-measuring instrument. Such as a Wheatstone Bridge.



First remove the weld and auxiliary stator leads from their connections inside the machine.

Second connect your test instrument to the following leads and measure the resistance.

WELD STATOR

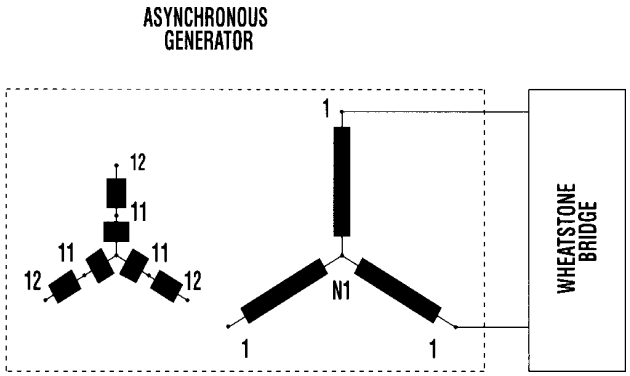
Lead 11 to Lead 11C	0.24560 ohm
Lead N2 to Lead 11C	0.01618 ohm
Lead N2 to Lead 11	0.00900 ohm

AUXILIARY POWER STATOR

Lead ¼ to Lead 1	0.24817 ohm
Lead 1 to Lead 1	0.24877 ohm
Lead 1 to Lead ¼	0.24789 ohm
Lead 2 to Lead ¼	0.06260 ohm

If the readings you receive are lower than shown above, this would indicate a winding to winding short in the stator and the stator would require replacement.

The resistance value relates to a cold coil at an ambient temperature of 20 degrees C (68 degrees F) and a generator with a nominal voltage of 460V 60 Hz.



WARNING: When the machine is working, there is a voltage of 440-500VAC at the capacitor terminals.

4.02 Replacing the Stator

To replace a stator it is recommended that you remove the engine, stator, and armature as one assembly. The assembly can then be set up on a workbench and the stator can be removed and reinstalled easier.

To remove the assembly, disconnect and remove the battery from the power supply. Them disconnect all stator leads and pull them through the separation panel.

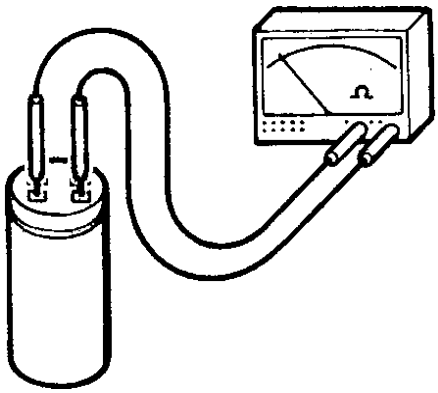
Unbolt the 4 engine motor mounts and disconnect the engine wire harness. Put a lifting strap around where the generator and engine are coupled and use a hoist to lift the assembly from the machine.

Remove the fan blade from the armature shaft and remove the 8 generator housing bolts, to remove the bearing carrier support. The stator should come off over the rotor. Reverse the steps to reinstall the new stator.

4.03 Excitation Capacitors

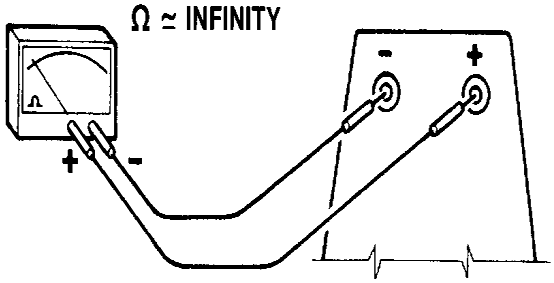
Disconnect the excitation capacitors from the circuit before testing. With a VOM touch the terminals of the capacitor being tested and observe:

a) Whether the needle of the tester shows a temporay passage of current, which would indicate that the capacitor is absorbing the load current and is therefore working.
b) Whether the needle of the tester goes to the bottom of the scale (zero resistance), which would show that the capacitor is in a short-circuit and must be replaced.



4.04 Output Rectifier

Select DC Reverse Polarity with the Weld Mode Selector Switch. Connect a VOM across the megative and positive output terminals of the welding generator. Use the diode check if equipped in your meter or ohms scale X 100. Your meter should indicate a low resistance in one direction and a high resistance in the other.



IF you see a shorted reading in both directions the output fiode assembly needs to be replaced.

4.05 Auto Idle Circuit

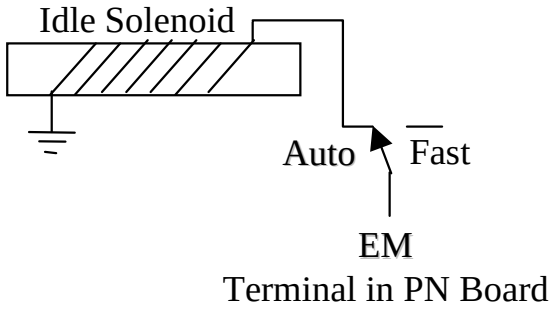
With the Auto Idle Switch in AUTO posistion.

When current is used from the auxiliary power outlets or when a welding arc is established, the TA 1 current transformer coil applies a AC signal to the TA terminal on the PC Board (11-3449).

This signal indicates to the board that current is being pulled from the machine and it removes the 12VDC output from EM output terminal of the PC Board. This 12VDC output is connected to the idle solenoid coil and with the idle solenoid re-energized the engine governor controls the speed of the engine. This engine speed can be set from 2600rpm minimum to 2800rpm maximum by the fine current control on the unit.

When the current load is removed, the unit will stay at high speed for approximately 10 seconds. After this time the PC Board will apply 12VDC from EM terminal through the closed posistion on the auto/idle switch to the idle solenoid coil. The solenoid will energize and lock the engine speed down to idle (2600rpm).

The auto/idle switch in the fast posistion (open) will bypass the auto control circuit. The unit will operate at the speed set by the fine adjust on the front panel continuously.



+ 12VDC to Idle
0VDC while welding or using auxiliary power.

PC BOARD TEST		
Test Points	**No Load**	**Load**

Frame Gnd. To TA	0 VDC	VAC @ 100A
Frame Gnd. To TA	12 VDC (idle)	0 VDC
	Measurements	
Frame Gnd. To 15/34	12VDC with ignition switch on.	
Frame Gnd. To OA	12VDC normal to 0VDC low oil alert.	
Frame Gnd. To FCS	12VDC to start and run	
Frame Gnd. To BCL	12VDC Normal	
Frame Gnd. to 50	12VDC with start button closed.	
Frame Gnd. To BC	12VDC at 3800rpm	
Frame Gnd. To 30	12VDC always	

For Schematic and PC Board layout see appendix A

4.06 Engine Oil Shut-Down Circuit Tests.

Check oil level before proceeding. Add the recommended engine oil if necessary.

The Oil-Alert switch is located inside the engine block. To test located the Yellow and Green wires coming from the engine block under the starter motor. With the engine not running disconnect the yellow and green wires from the wire harness. Check for continuity between the yellow and Green wires with a VOM. If a short circuit is measured (No Resistance) the Oil-Alert Switch is defective and should be replaced. **Contact your local engine Service Center for replacement procedure.**

4.07 Engine Charge Circuit Shut-Down Test.

The engine in the Predator incorporates a 3 Amp charging circuit. To test the rectifier disconnect the White and two green wires from the wire harness going to the rectifier. The rectifier is located on the side of the engine above the starter. Check for resistance between wires as indicated in the table below.

CHG1(Gr) to CHG2(Gr)	Infinity
CHG1(Gr) or CHG2(Gr) to DC(W)	Continuity
CHG1(Gr) or CHG2(Gr) to Ground	Infinity
DC(W) to CHG1(Gr)	Infinity
DC(W) to CHG2(Gr)	Infinity
DC(W) to Ground	Infinity
Ground to CHG1(Gr) or CHG2(Gr)	Continuity
Ground to DC (W)	Continuity

Should reading not match replace rectifier.

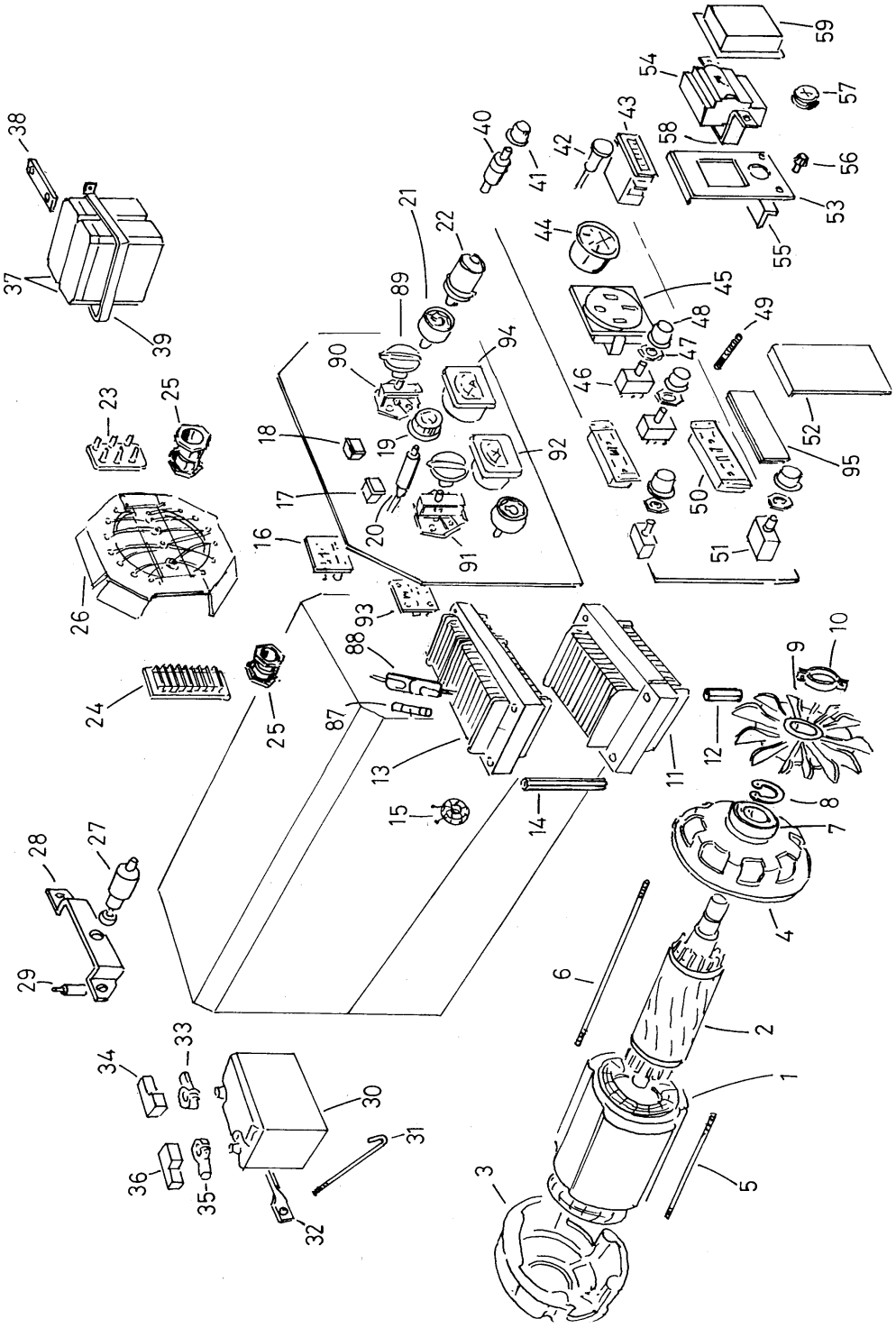
To test the charge coil disconnect the two charge coil windings. Check resistance between wires as indicated in table below.

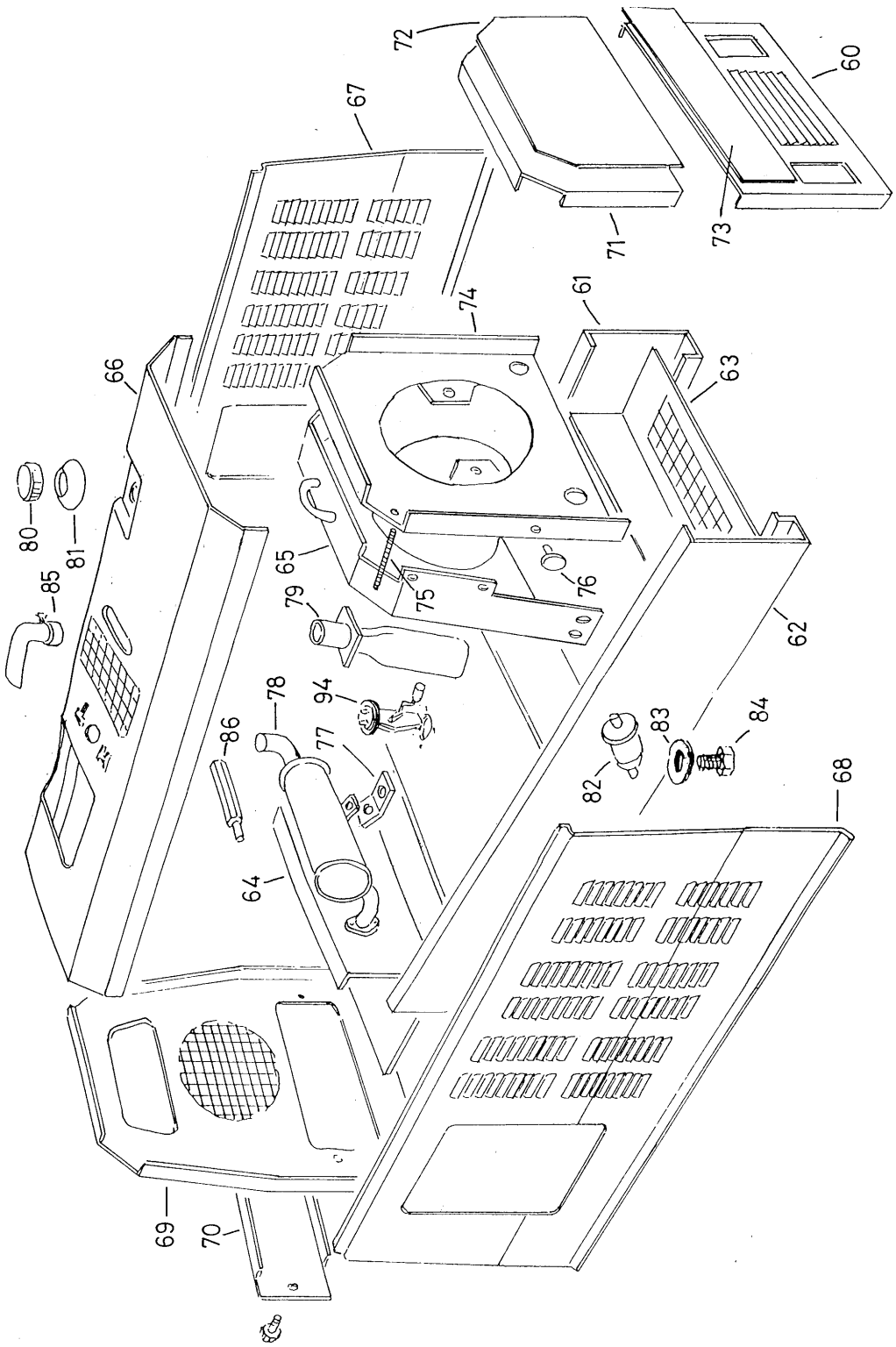
Resistance	0.23 – 0.31 ohms

Should reading not match replace charge coil.

SECTION 5: PARTS LIST

5.01 Revision A & B

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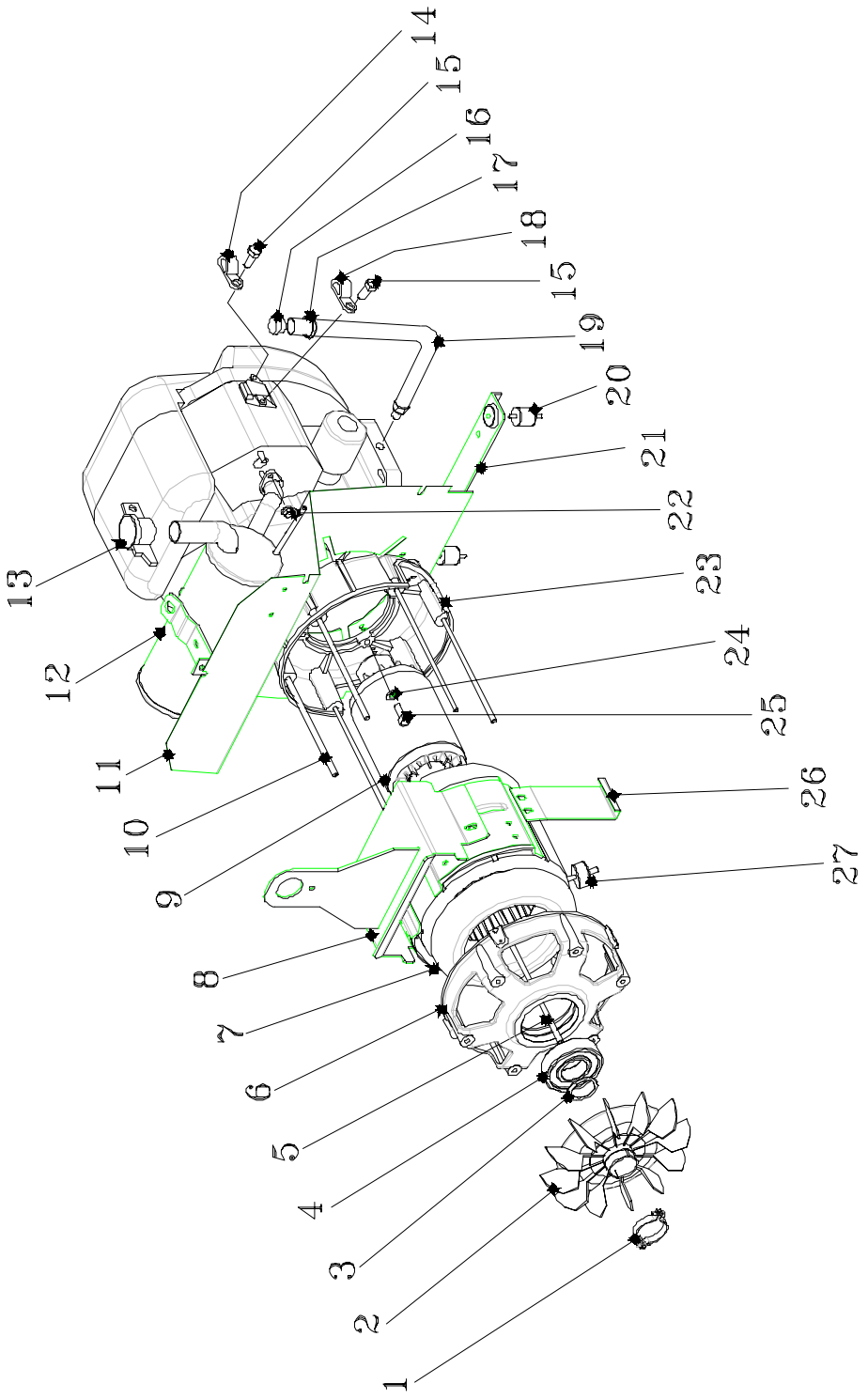
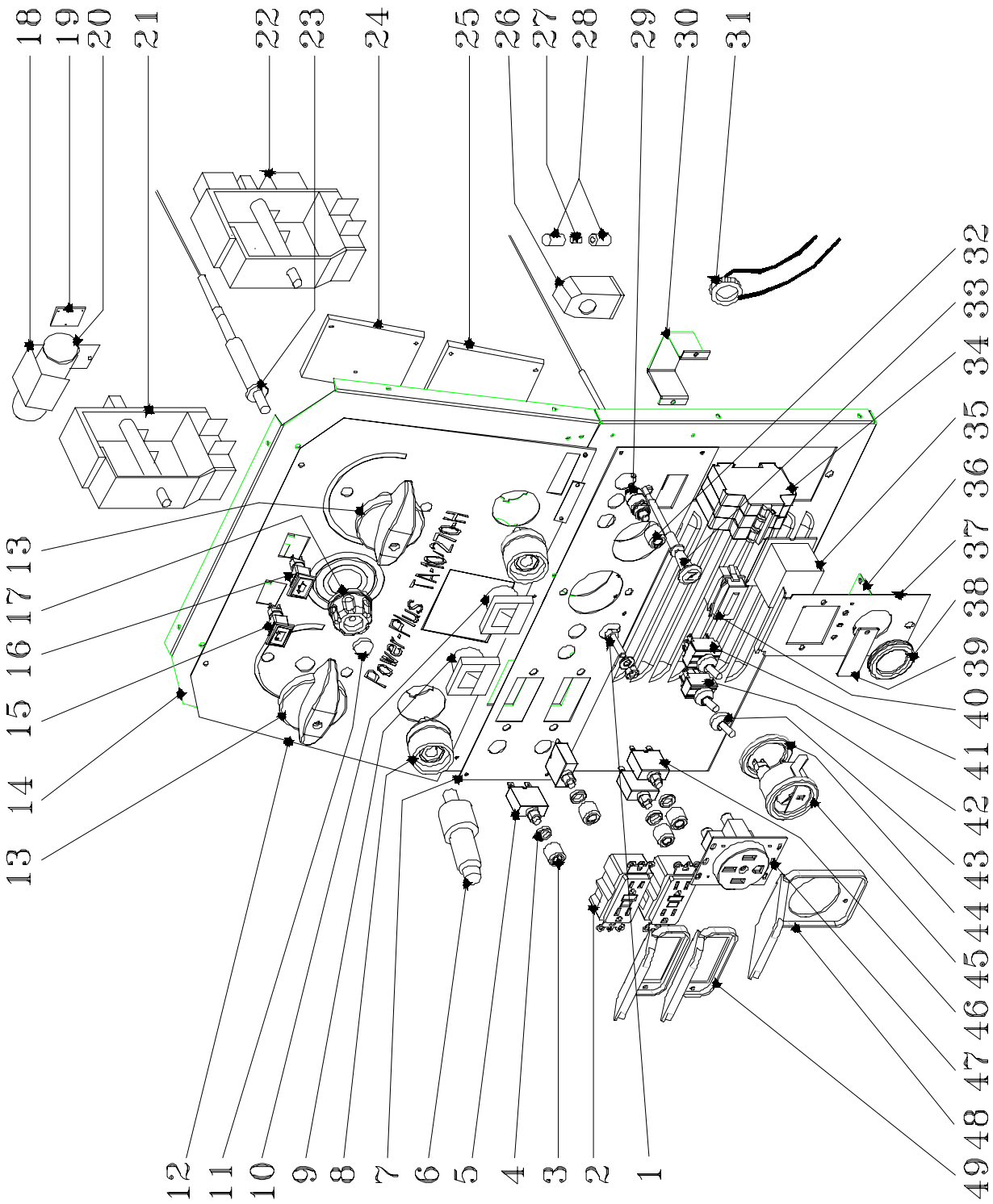
Item	Catalog Number		
	A Rev.	B Rev.	Description
1	11-3214	11-3731	Stator
2	11-3215	11-3215	Rotor
3	11-3216	11-3216	Engine connecting flange
4	11-3217	11-3217	Flange with bearing seat
5	11-3218	11-3218	Stator tie-rod
6	11-3219	11-3219	Rotor tie-rod
7	11-3078	11-3078	Bearing
8	11-3077	11-3077	Seeger ring
9	11-3220	11-3220	Fan
10	11-3221	11-3221	Fan ring
11	11-3222	11-3431	Reactor DC
12	11-3223	11-3223	Spacer
13	11-3224	11-3432	Reactor AC
14	11-3225	11-3225	Spacer
15	11-3120	11-3318	Amperometric transformer
16	11-3226	11-3226	GS9712 electronic panel
17	11-3227	11-3227	Signal lamp battery charge
18	11-3228	11-3228	Signal lamp oil pressure
19	11-3229	11-3229	Knob fine adjust
20	11-3230	11-3230	Fine adjust throttle unit
21	11-3231	11-3231	Welding outlet
22	11-3232	11-3232	Plug for welding outlet
23	11-3233	11-3233	6 poles terminal board
24	11-3091	11-3091	8 poles terminal board
25	11-3093	11-3093	1" 1/2 wire holder
26	11-3234	11-3433	Rectifier assembly
27	11-3235	11-3235	Throttle solenoid
28	11-3236	11-3236	Solenoid support
29	11-3237	11-3237	Solenoid pin
30	-	-	340A 12V battery
31	11-3239	11-3239	Battery tie-rod
32	11-3240	11-3240	Battery clamp
33	11-3192	11-3192	Negative battery charging clip
34	11-3193	11-3193	Blue cover battery charging clip
35	11-3190	11-3190	Positive battery charging clip
36	11-3191	11-3191	Red cover battery charging clip
37	11-3241	11-3286	3x70 µF capacitors
38	11-3142	11-3142	Bridge for capacitors
39	11-3287	11-3287	Plate for capacitors
40	11-3152	11-3152	Start button
41	11-3153	11-3153	Start button cover
42	11-3243	11-3243	Choke knob assembly
43	11-3151	11-3151	Hour meter
44	11-3150	11-3150	Fuel meter
45	11-3046	11-3046	230V 50A 14-50 single phase outlet
46	11-3149	11-3149	40A circuit breaker
47	11-3048	11-3048	Ring
48	11-3049	11-3049	Circuit breaker cover
49	11-3100	11-3100	Earth clamp

50	**11-3050**	**11-3050**	**115V 2x15A GFCI 5-12R single phase outlet**
Item	**Catalog Number**		
	A Rev.	**B Rev.**	**Description**
51	**11-3148**	**11-3148**	**20A circuit breaker**
52	**11-3244**	**11-3244**	**230 Cover**
53	**11-2145**	**11-3245**	**460 Cover**
54	**11-3246**	**11-3246**	**460V 3 phase Breaker**
55	**11-3138**	**11-3138**	**Cable holder**
56	**11-3141**	**11-3141**	**Pin**
57	**11-3140**	**11-3140**	**Rubber wire holder**
58	**11-3137**	**11-3137**	**Plate for circuit breaker**
59	**11-3143**	**11-3143**	**460V Circuit breaker cover**
60	**11-3247**	**11-3247**	**Lower front panel**
61	**11-3248**	**11-3434**	**Right frame**
62	**11-3249**	**11-3435**	**Left frame**
63	**11-3250**	**11-3250**	**Reactor support**
64	**11-3251**	**11-3251**	**Battery support**
65	**11-3252**	**11-3436**	**Hook**
66	**11-3253**	**11-3437**	**Cover**
67	**11-3254**	**11-3438**	**Right panel**
68	**11-3255**	**11-3439**	**Left panel**
69	**11-3256**	**11-3440**	**Rear panel**
70	**11-3257**	**11-3257**	**Battery cover**
71	**11-3258**	**11-3258**	**Front panel**
72	**11-3259**	**11-3259**	**Upper aluminum front panel**
73	**11-3260**	**11-3260**	**Lower aluminum front panel**
74	**11-3261**	**11-3261**	**Panel**
75	**11-3262**	**11-3262**	**Tie-rod**
76	**11-3263**	**11-3263**	**Rubber Bumper**
77	**11-3264**	**11-3441**	**Silencer holder**
78	**11-3265**	**11-3265**	**Silencer**
79	**11-3266**	**11-3266**	**Fuel tank**
80	**11-3267**	**11-3267**	**1" 1/2 cap fuel tank**
81	**11-3268**	**11-3442**	**Gasket fuel tank**
82	**11-3269**	**11-3269**	**Fuel filter**
83	**11-3270**	**11-3270**	**Washer**
84	**11-3271**	**11-3271**	**Fuel drain cap**
85	**11-3272**	**11-3272**	**Silencer extension**
86	**11-3273**	**11-3273**	**Oil drain**
87	**11-3274**	**11-3274**	**Fuse 25A**
88	**11-3118**	**11-3118**	**Fuse holder**
89	**11-3275**	**11-3275**	**Knob weld process**
90	**11-3276**	**11-3276**	**Weld process selector assembly**
91	**11-3277**	**11-3443**	**Current selector assembly**
		11-3375	**115V Receptacle**
	11-3615	**11-3615**	**Fuel Sending Unit**
		11-3448	**Oil Level Dipstick**
		11-3446	**Stator Bracket**
		11-3445	**Stator Holder**

5.02 Revision C



Item	Catalog Number	Description
1	11-3592	Fan ring
2	11-3593	Fan
3	11-3077	Seeger ring
4	11-3078	Bearing
5	11-3633	Rotor tie-rod
6	11-3595	Flange with bearing seat
7	11-3596	Stator
8	11-3597	Hook
9	11-3632	Rotor
10	11-3599	Tie rod
11	11-3657	Engine bulkhead
12	11-3791	Silencer
13	11-3499	Flap
14	11-3603	Clamp “10”
15	-	Flange screw M6x16 mm
16	11-3721	Oil drain cap
17	11-3722	Hose clamp
18	11-3719	Clamp “20”
19	11-3720	Oil drain pipe
20	11-3017	Engine shock absorber 30x30 mm
21	11-3795	Engine holder
22	-	Flange nut M8
23	11-3659	Engine connection flange
24	-	Washer M10
25	-	Screw M9x30 mm
26	11-3608	Stator plate
27	11-3660	Stator shock absorber 40x25 mm.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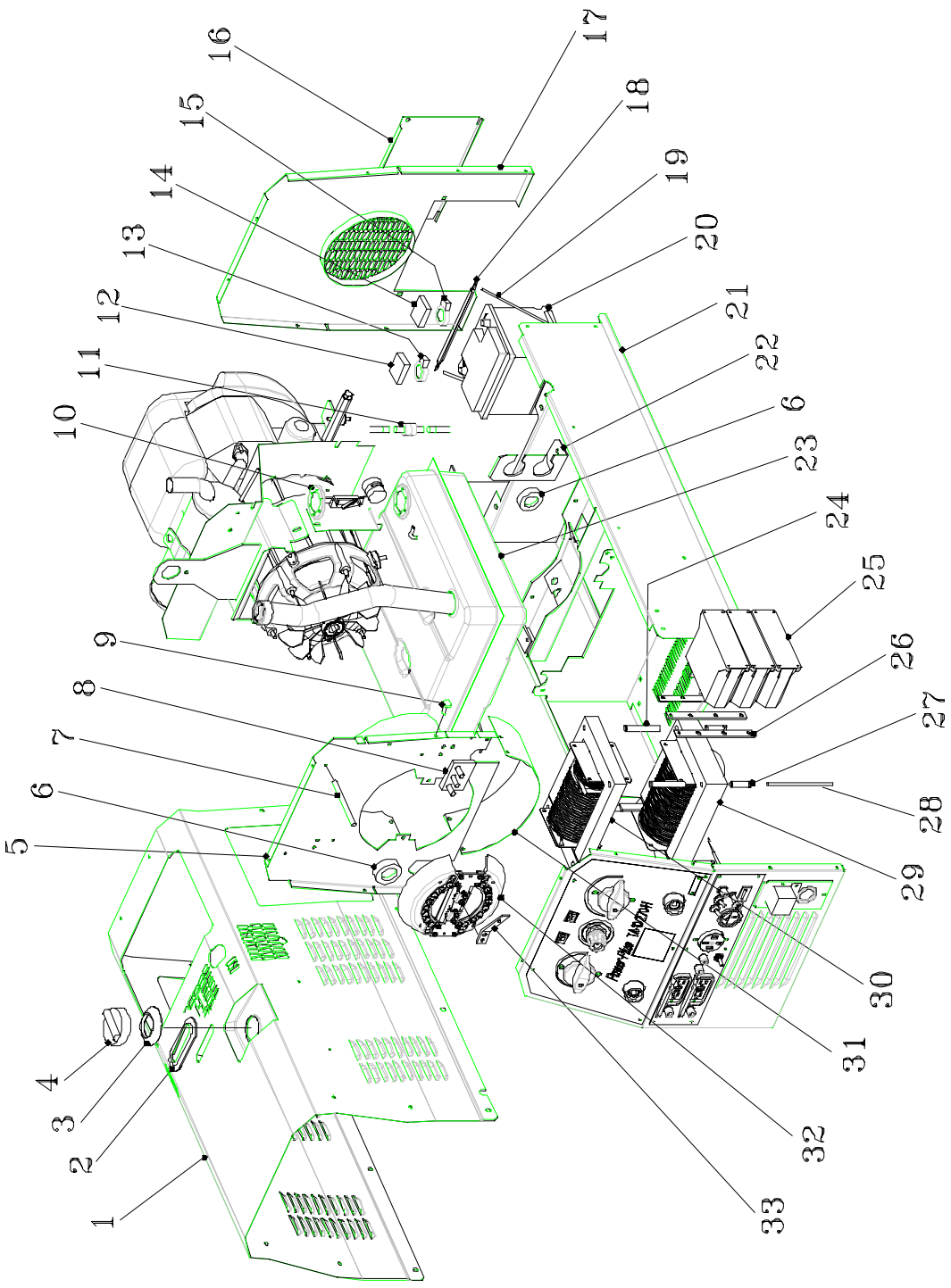
32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49
13 14 15 16 17 13
12 11 10 9 8 7 6 5 4 3 2 1
Power-Plus TA-1027CH

Item	Catalog Number	Description
1	11-3100	Earth clamp
2	11-3050	115V 2x15A GFCI 5-12R single phase outlet
3	11-3049	Circuit breaker cover
4	11-3048	Ring
5	11-3047	15A circuit breaker
6	11-3232	Plug for welding outlet
7	11-3686	Lower aluminium
8	11-3231	Welding outlet
9	11-3125	F.S 100V voltmeter (*)
10	11-3279	F.S. 400/5A ammeter (*)
11	11-3549	Cap
12	11-3685	Upper aluminium front plate
13	11-3275	Knob weld process
14	11-3622	Front panel
15	11-3227	Battery charge signal lamp
16	11-3228	Capacitor holder
17	11-3229	Knob fine adjust
18	11-3623	Capacitor holder
19	11-3624	GS9811 electronic panel
20	11-3625	40µF capacitor
21	11-3277	Current selector assembly
22	11-3276	Weld process selector assembly
23	11-3626	Fine adjust throttle unit
24	11-3449	GS9712/A electronic panel
25	11-3278	GS9713 electronic panel (*)
26	11-3447	400/5A amperometric transformer (*)
27	11-3274	25A fuse
28	11-3118	Fuse holder
29	11-3152	Start button
30	11-3137	Plate for circuit breaker
31	11-3318	Amperometric transformer
32	11-3153	Start button cover
33	11-3243	Choke knob assembly
34	11-3681	13A 3 poles circuit breaker
35	11-3143	Circuit breaker cover
36	11-3138	Cable holder
37	11-3245	Cover
38	11-3087	Rubber wire holder
39	11-3510	Cover
40	11-3045	Hour meter
41	11-3809	Stop/Run switch
42	11-3811	Auto/High switch
43	11-3723	Switch cover
44	11-3810	O-ring
45	11-3150	Fuel meter
46	11-3149	40 A circuits breaker
47	11-3046	230V 50A 14-50 single phase outlet
48	11-3789	230V 50A 14-50 single phase cover

49	11-3375	115V 2x15A GFCI 5-12R single phase cover.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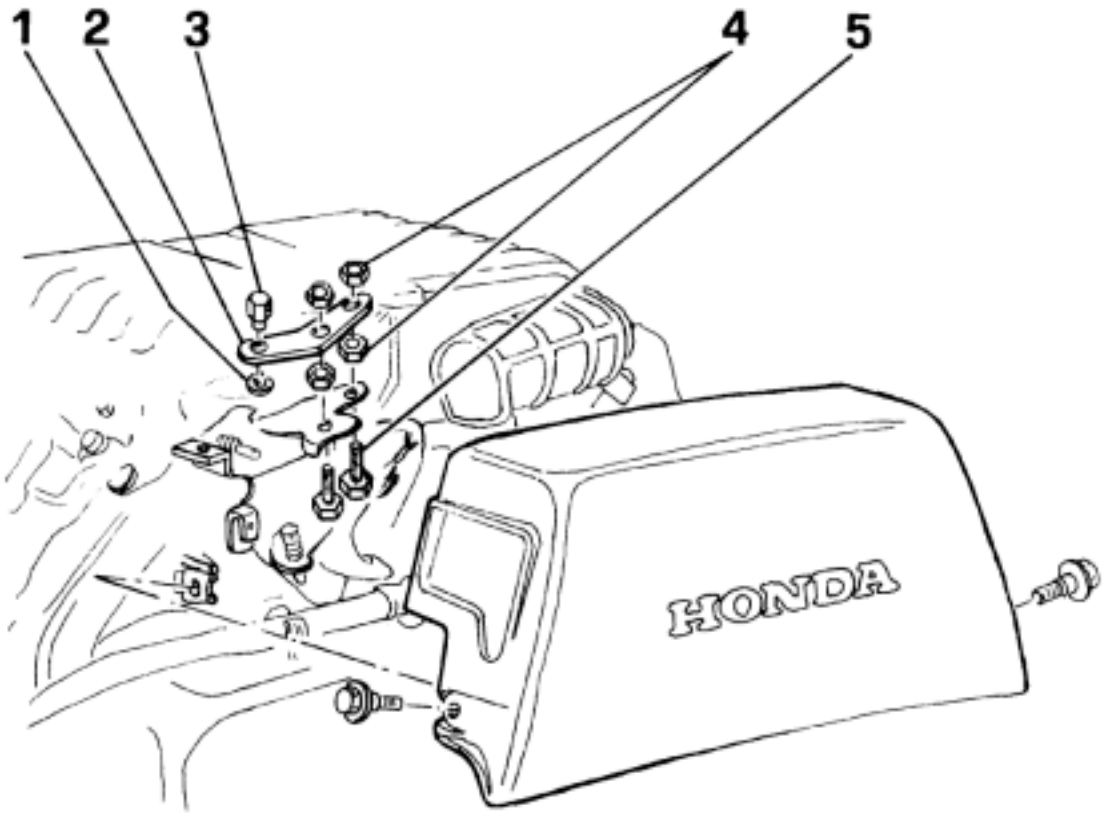
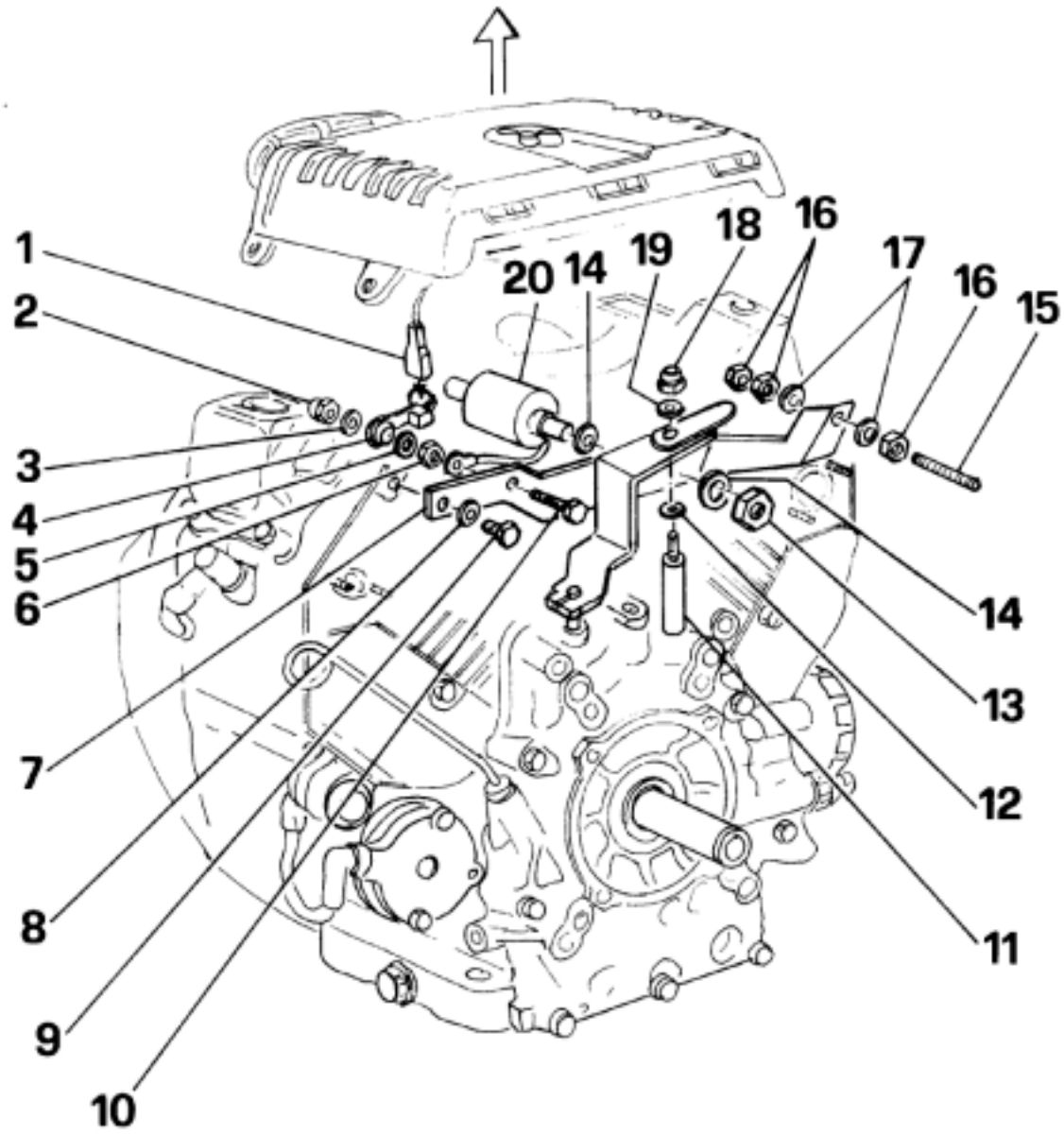
Item	Catalog Number	Description
1	11-3605	Canopy
2	11-3610	Hook gasket
3	11-3611	Fuel tank cap gasket
4	11-3612	Fuel tank cap
5	11-3613	Panel
6	11-3087	Rubber wire holder
7	11-3262	Tie-rod
8	11-3614	3 poles terminal board
9	11-3263	Rubber puffer
10	11-3615	Fuel level gauge
11	11-3269	Fuel prefilter
12	11-3191	Red cover battery charging clip
13	11-3190	Positive battery charging clip
14	11-3193	Blue cover battery charging clip
15	11-3192	Negative battery charging clip
16	11-3257	Battery cover
17	11-3062	Rear panel
18	11-3240	Battery clamp
19	11-3544	Battery tie-rod
20	-	44 Ah 12V battery
21	11-3616	Frame
22	11-3790	Support
23	11-3677	Fuel tank
24	11-3661	Spacer
25	11-3241	3x60 capacitor
26	11-3618	Bridge for capacitor
27	11-3662	Spacer
28	11-3663	Reactor tie-rod
29	11-3554	DC reactor
30	11-3432	AC reactor
31	11-3619	Lower conveyor
32	11-3687	Rectifier assembly
33	11-3631	Shunt



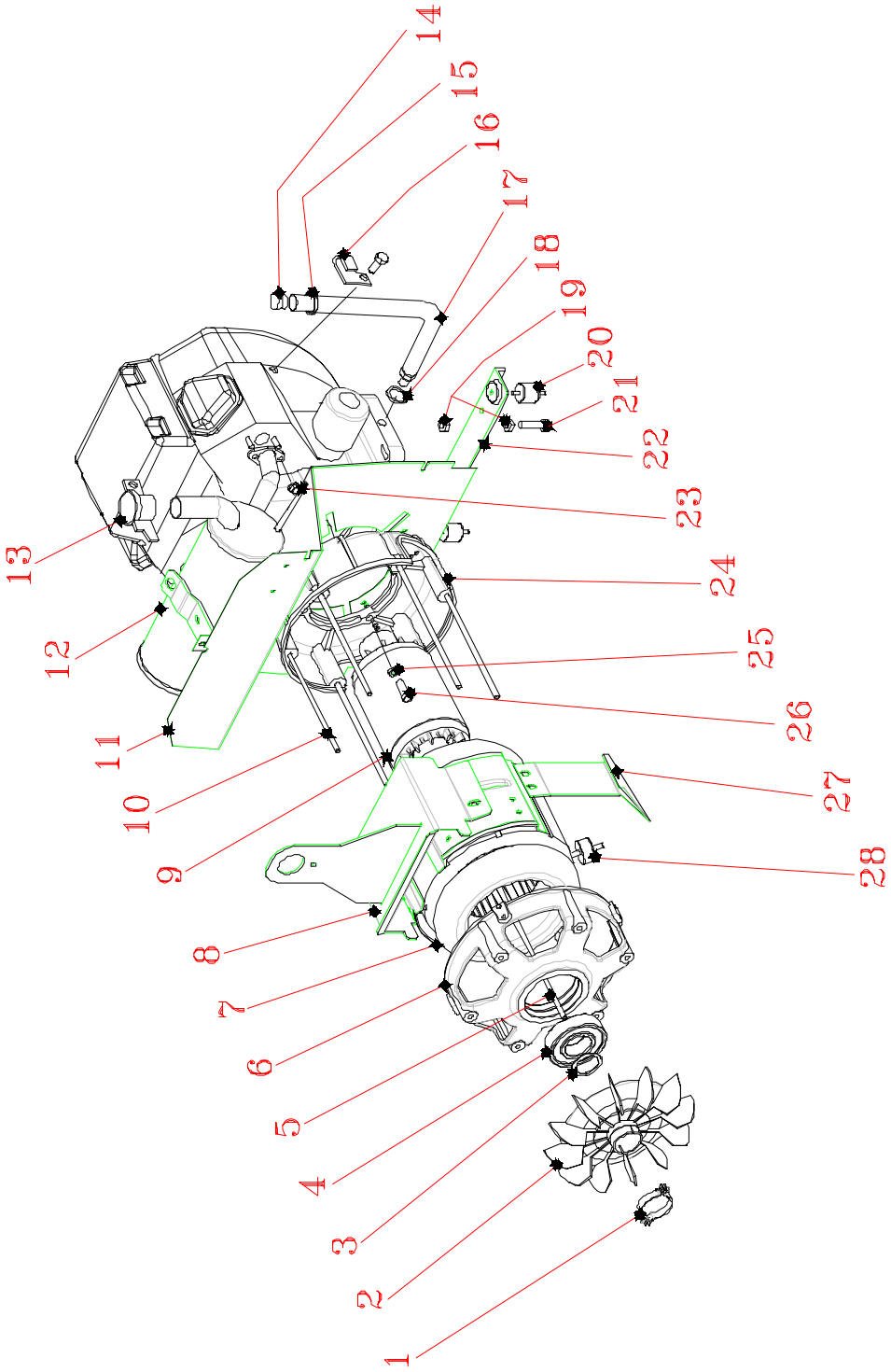
Item	Catalog Number	Description
1	11-3627	RS6 Seeger
2	11-3628	Throttle plate
3	11-3629	Pin
4	-	Nut M6
5	-	Screw M6x16 mm.



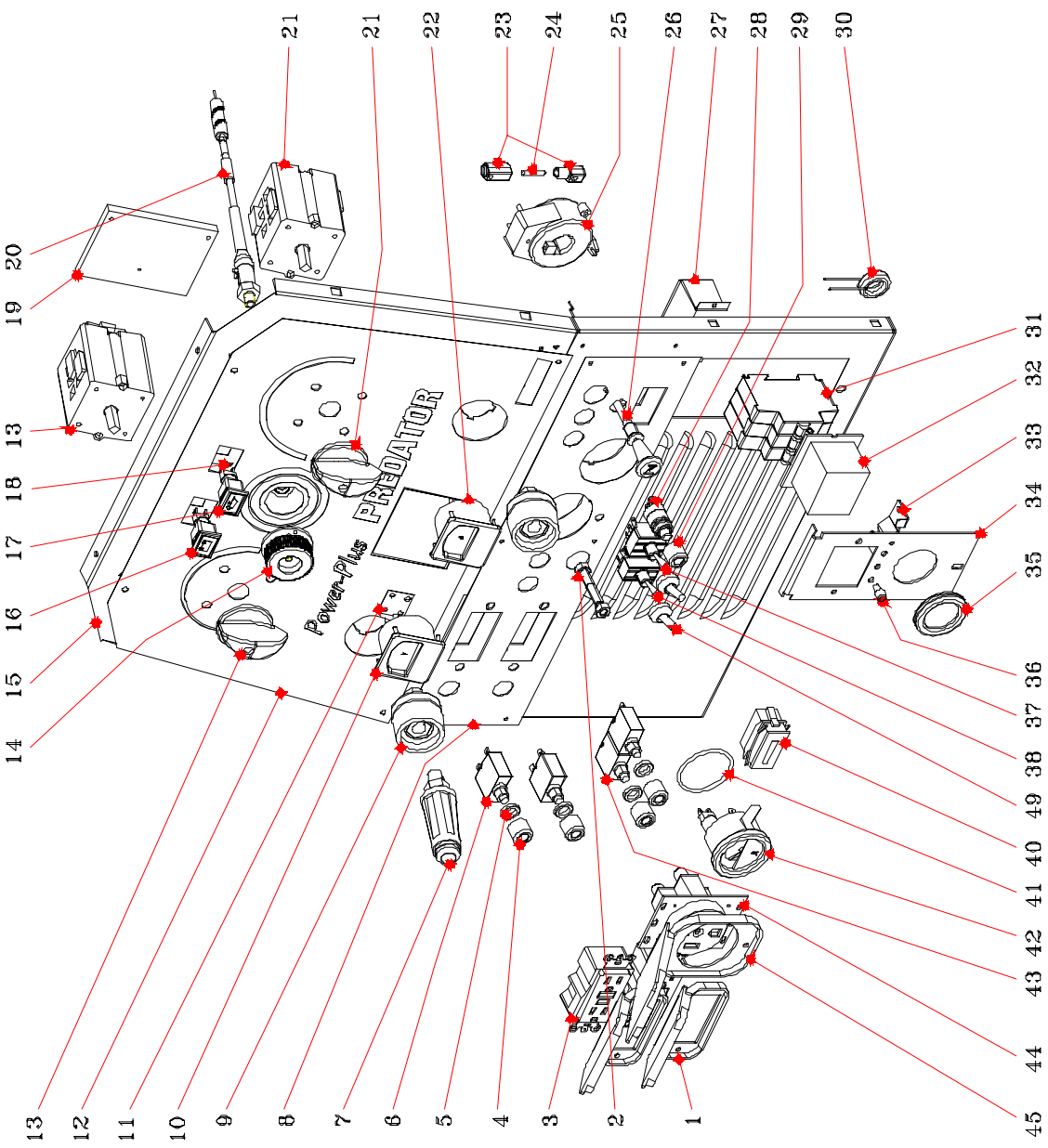
Item	Catalog Number	Description

1	-	Wire assembly
2	-	Stop nut M 5
3	-	Washer M 5
4	11-3542	Clamp
5	-	Washer M 5
6	-	Nut M 5
7	11-3236	Solenoid support
8	-	Washer M 8
9	-	Screw M 8x16
10	-	Screw M 5x25
11	11-3237	Solenoid pin
12	-	Washer M 6
13	-	Low nut M 12
14	-	Washer M 12
15	-	Tie-rod M 8x60
16	-	Nut M 8
17	-	Washer M 8
18	-	Low nut M 6
19	-	Copper washer M 6
20	11-3235	Solenoid.

5.03 Revision D



Item	Catalog Number	Description
1	11-3592	Fan ring
2	11-3593	Fan
3	11-3077	Seeger ring
4	11-3078	Bearing
5	11-3633	Rotor tie-rod
6	11-3595	Flange with bearing seat
7	11-3596	Stator
8	11-3597	Hook
9	11-3632	Rotor
10	11-3599	Tie rod
11	11-3873	Engine bulkhead
12	11-3869	Silencer
13	11-3499	Flap
14	11-3721	Oil drain cap
15	11-3722	Hose clamp
16	11-3868	Clamp
17	11-3720	Oil drain pipe
18	11-3533	Washer
19	11-3851	Nut M8
20	11-3017	Engine shock absorber 30x30 mm
21	11-3896	Screw M8x25 mm
22	11-3795	Engine holder
23	11-3871	Flange nut M5x16
24	11-3659	Engine connection flange
25	11-3872	Washer M10
26	11-3870	Screw 3/8 x 1, 1/4
27	11-3608	Stator plate
28	11-3660	Stator shock absorber 40x25 mm.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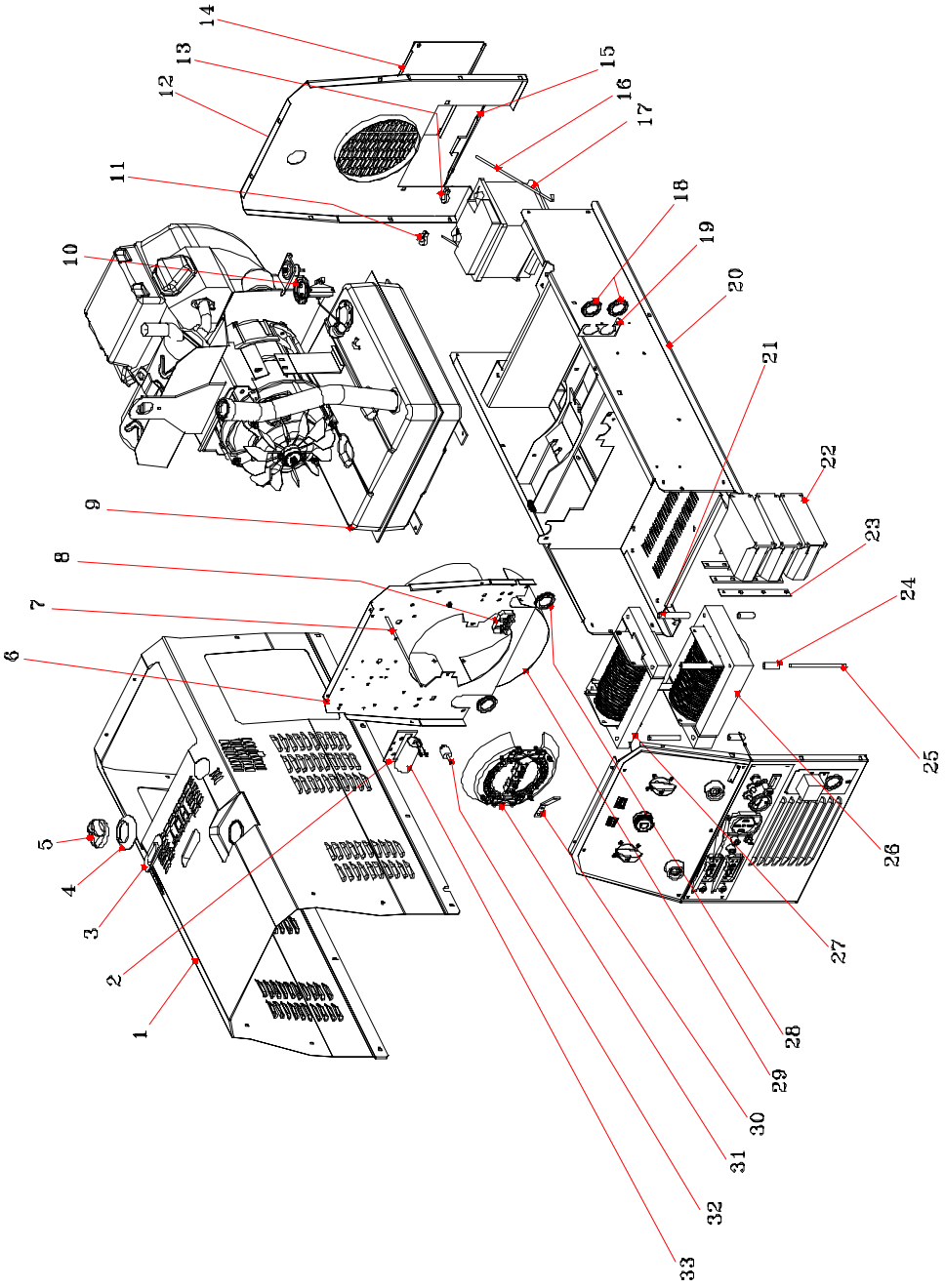
Item	Catalog Number	Description
1	11-3375	115V 2x15A GFCI 5-12R single phase cover
2	11-3100	Earth clamp
3	11-3050	115V 2x15A GFCI 5-12R single phase outlet
4	11-3049	Circuit breaker cover
5	11-3048	Ring
6	11-3148	20A circuit breaker
7	11-3232	Plug for welding outlet
8	11-3620	Lower aluminium
9	11-3231	Welding outlet
10	11-3125	F.S 100V voltmeter (*)
11	11-3278	GS9713 electronic panel (*)
12	11-3905	Upper aluminium front plate
13	11-3797	Current selector assembly
14	11-3229	Knob fine adjust
15	11-3622	Front panel
16	11-3227	Battery charge signal lamp
17	11-3876	Oil pressure signal lamp
18	11-3875	Resistor 15 ohm ¼ W
19	11-3449	GS9712/A electronic panel
20	11-3877	Fine adjust throttle unit
21	11-3798	Weld process selector assembly
22	11-3279	F.S. 400/5A ammeter (*)
23	11-3118	Fuse holder
24	11-3274	25A fuse
25	11-3447	400/5A amperometric transformer (*)
26	11-3243	Choke knob assembly
27	11-3137	Plate for circuit breaker
28	11-3152	Start button
29	11-3153	Start button cover
30	11-3318	Amperometric transformer
31	11-3681	13A 3 poles circuit breaker
32	11-3143	Circuit breaker cover
33	11-3138	Cable holder
34	11-3245	Cover
35	11-3087	Rubber wire holder
36	11-4028	Rubber cap
37	11-3809	Stop/Run switch
38	11-3792	Auto/High switch
39	11-3723	Switch cover
40	11-3045	Hour meter
41	11-3810	O-ring
42	11-3150	Fuel meter
43	11-3149	50 A circuits breaker
44	11-3046	230V 50A 14-50 single phase outlet
45	11-3789	230V 50A 14-50 single phase cover.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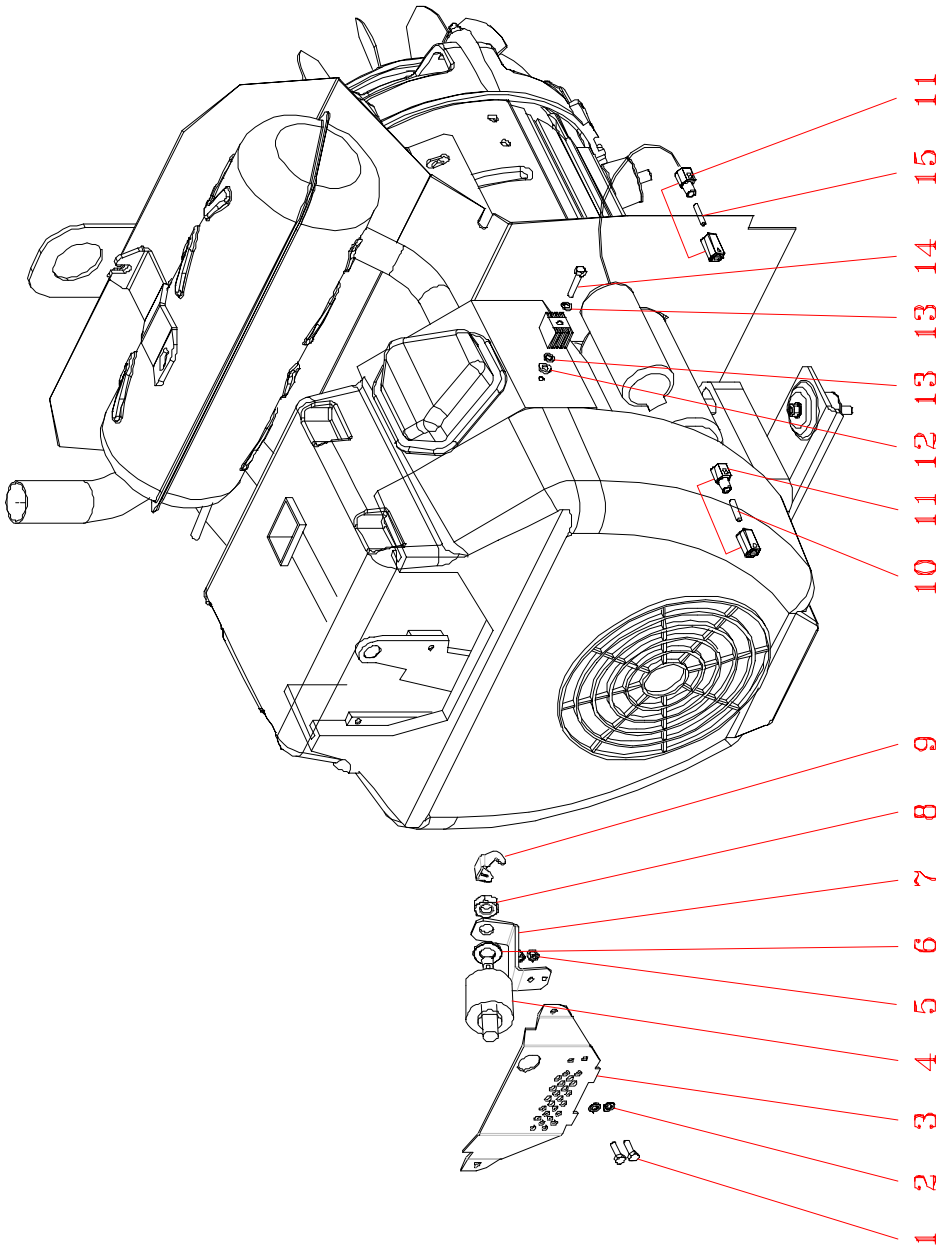
Item	Catalog Number	Description
1	11-3881	Canopy
2	11-3806	Capacitor support
3	11-3610	Hook gasket
4	11-3611	Fuel tank cap gasket
5	11-3612	Fuel tank cap
6	11-3613	Panel
7	11-3262	Tie-rod
8	11-3614	3 poles terminal board
9	11-3677	Fuel tank
10	11-3615	Fuel level gauge
11	11-3190	Positive battery charging clip
12	11-3880	Rear panel
13	11-3948	Negative battery charging clip
14	11-3257	Battery cover
15	11-3895	Battery clamp
16	11-3544	Battery tie-rod
17	-	44 Ah 12V battery
18	11-3878	Rubber wire holder
19	11-3790	Support
20	11-3616	Frame
21	11-3661	Spacer
22	11-3241	3x60 capacitor
23	11-3618	Bridge for capacitor
24	11-3662	Spacer
25	11-3663	Reactor tie-rod
26	11-3554	DC reactor
27	11-3432	AC reactor
28	11-3087	Rubber wire holder
29	11-3619	Lower conveyor
30	11-3631	Shunt
31	11-3879	Rectifier assembly
32	11-3504	Insulator
33	11-3625	40µF 250V capacitor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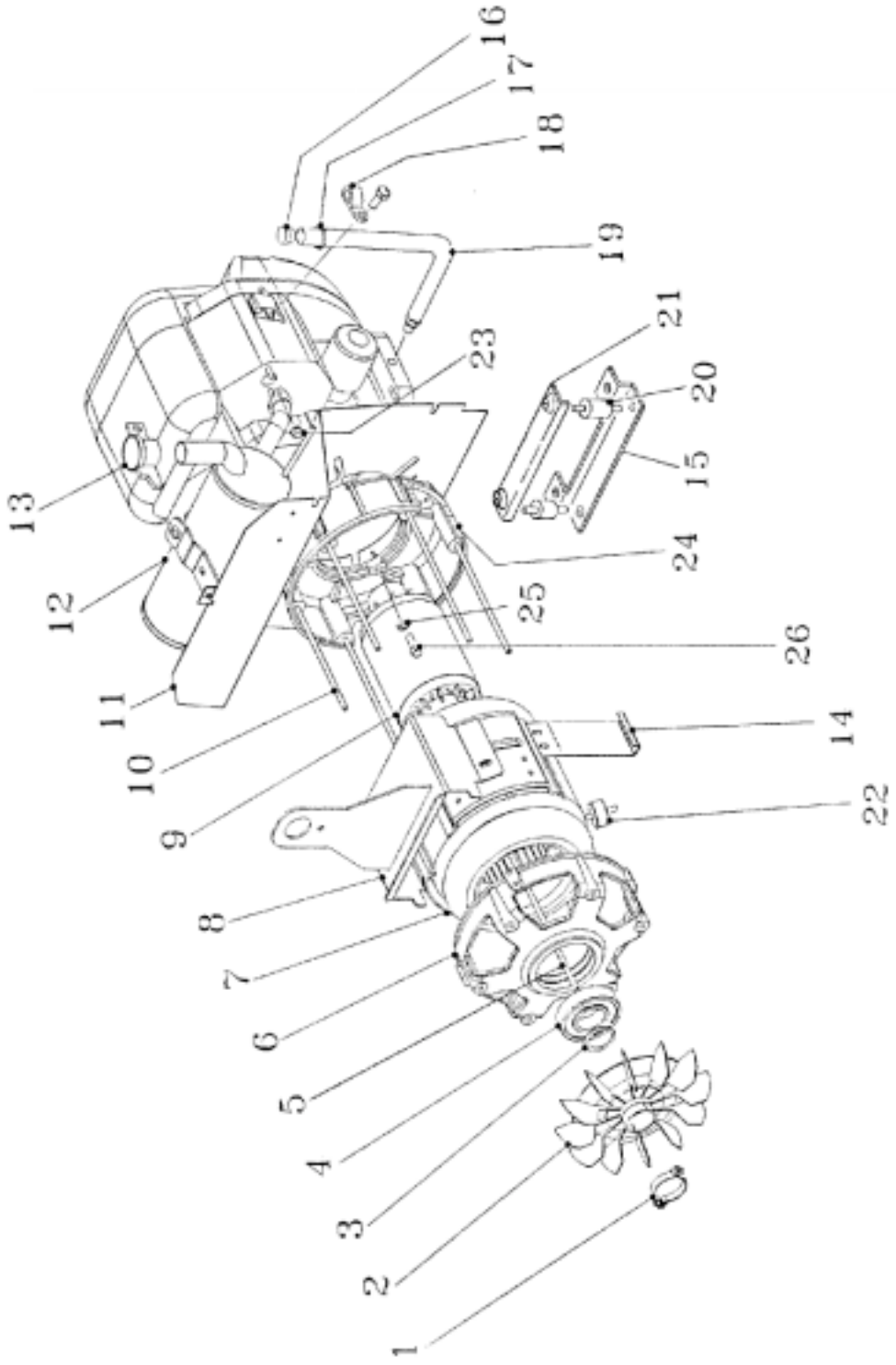
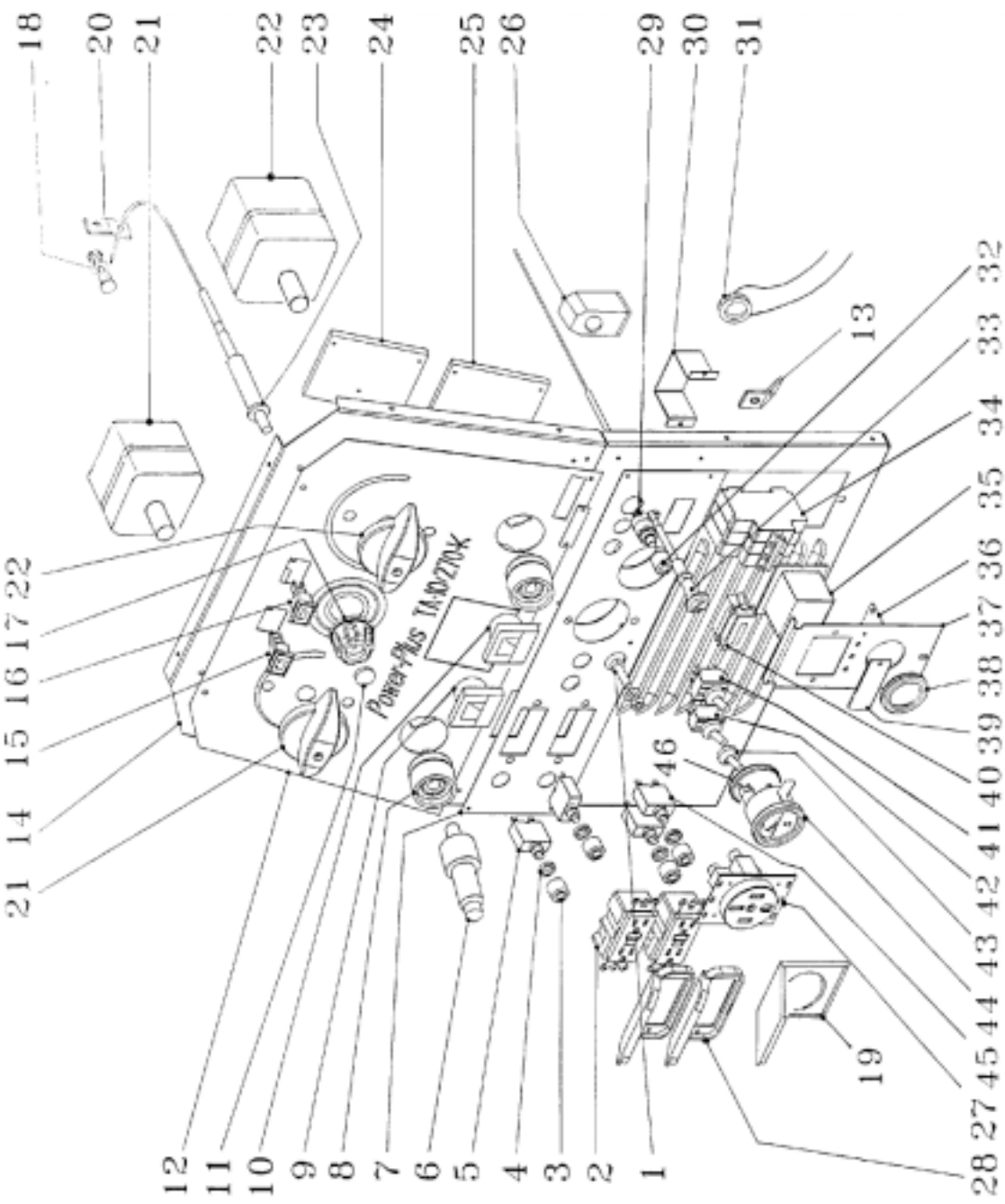
Item	Catalog Number	Description
1	11-3901	Screw M5x12 mm
2	11-3886	Washer M5 mm
3	11-3898	Solenoid protection
4	11-3235	Solenoid
5	11-3902	Nut M5 mm
6	11-3904	Washer M12 mm
7	11-3897	Solenoid support
8	11-3903	Low nut M12 mm
9	11-3899	Throttle plate
10	11-3894	Fuse 5A
11	11-3118	Fuse holder
12	11-3891	Washer M8x18 mm
13	11-3892	Washer M6 mm
14	11-3893	Screw M6x40 mm
15	11-3274	Fuse 25A

5.04 With Kohler Engine



Item	Catalog No.	Description
1	11-3592	Fan ring
2	11-3593	Fan
3	11-3077	Seeger ring
4	11-3078	Bearing
5	11-3633	Rotor tie-rod
6	11-3595	Flange with bearing seat
7	11-3596	Stator
8	11-3597	Hook
9	11-3632	Rotor
10	11-3599	Tie rod
11	11-3873	Engine bulkhead
12	11-3793	Silencer
13	11-3499	Flap
14	11-3608	Stator plate
15	11-3961	Engine bracket
16	11-3721	Oil drain cap
17	11-3722	Hose clamp
18	11-3719	Clamp “20”
19	11-3794	Oil drain pipe
20	11-3017	Engine shock absorber 30x30 mm
21	11-3795	Engine bracket
22	11-3660	Stator shock absorber 40x25 mm
23	11-3851	Flange nut M8
24	11-3659	Engine connection flange
25	11-3872	Washer M10
26	11-3870	Screw 3/8”x1 ¼
	11-3235	Idle Solenoid (Not Shown)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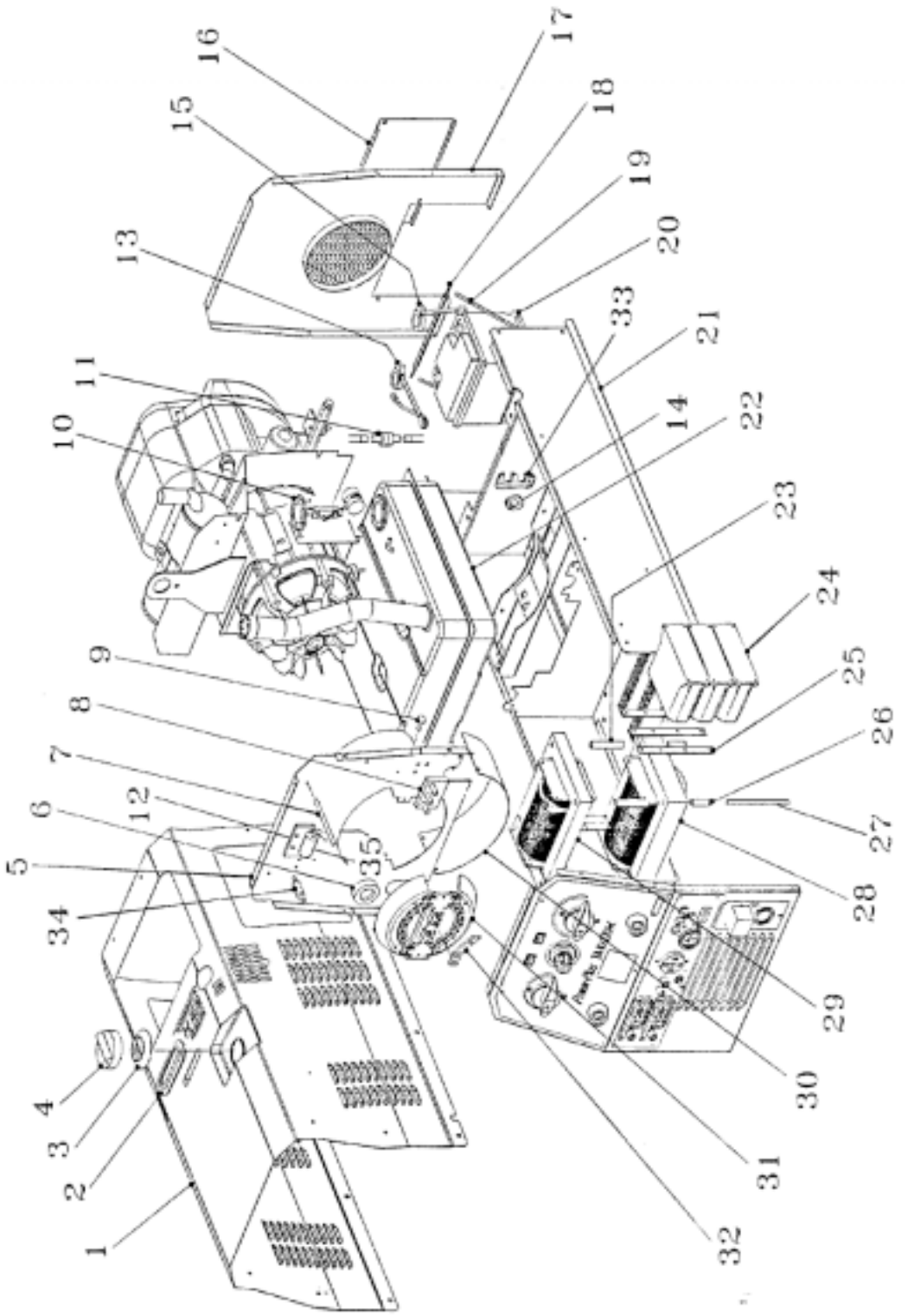
Power-Plus TA-0270K

Item	Catalog No.	Description
1	11-3100	Earth clamp
2	11-3050	115V 2x15A GFCI 5-12R single phase outlet
3	11-3049	Circuit breaker cover
4	11-3048	Ring
5	11-3148	20A circuit breaker
6	11-3232	Plug for welding outlet
7	11-3620	Lower aluminium
8	11-3231	Welding outlet
9	11-3125	F.S 100V voltmeter (*)
10	11-3279	F.S. 400/5A ammeter (*)
11	11-3549	Cap
12	11-3796	Upper aluminium front plate
13	11-3801	Plate for earth clamp
14	11-3622	Front panel
15	11-3227	Battery charge signal lamp
16	11-3228	Oil pressure signal lamp
17	11-3229	Knob fine adjust
18	11-3802	Clamping screw
19	11-3789	230V 50A 14-50 single phase cover
20	11-3800	Plate for fine adjust throttle unit
21	11-3797	Current selector assembly
22	11-3798	Weld process selector assembly
23	11-3799	Fine adjust throttle unit
24	11-3807	GS9910 electronic panel
25	11-3278	GS9713 electronic panel (*)
26	11-3447	400/5A amperometric transformer (*)
27	11-3046	230V 50A 14-50 single phase outlet
28	11-3375	115V 2x15A GFCI 5-12R single phase cover
29	11-3152	Start button
30	11-3137	Plate for circuit breaker
31	11-3318	Amperometric transformer
32	11-3153	Start button cover
33	11-3243	Choke knob assembly
34	11-3779	13A 3 poles circuit breaker
35	11-3143	Circuit breaker cover
36	11-3138	Cable holder
37	11-3245	Cover
38	11-3087	Rubber wire holder
39	11-3510	Cover
40	11-3045	Hour meter
41	11-3809	Stop/Run switch assembly
42	11-3792	Auto/high switch assembly
43	11-3723	Switch cover
44	11-3150	Fuel meter
45	11-3149	50A circuits breaker
46	11-3810	O-ring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Item	Catalog No.	Description
1	11-3803	Canopy
2	11-3610	Hook gasket
3	11-3611	Fuel tank cap gasket
4	11-3612	Fuel tank cap
5	11-3804	Panel
6	11-3087	Rubber wire holder
7	11-3262	Tie-rod
8	11-3614	3 poles terminal board
9	11-3263	Rubber puffer
10	11-3615	Fuel level gauge
11	11-3269	Fuel prefilter
12	11-3806	Capacitor holder
13	11-3949	Positive battery charging clip
14	11-3806	Capacitor holder
15	11-3948	Negative battery charging clip
16	11-3257	Battery cover
17	11-3805	Rear panel
18	11-3895	Battery clamp
19	11-3544	Battery tie-rod
20	11-3543	44 Ah 12V battery
21	11-3616	Frame
22	11-3677	Fuel tank
23	11-3661	Spacer
24	11-3241	3x60 µF capacitor
25	11-3618	Bridge for capacitor
26	11-3662	Spacer
27	11-3663	Reactor tie-rod
28	11-3554	DC reactor
29	11-3432	AC reactor
30	11-3619	Lower conveyor
31	11-3879	Rectifier assembly
32	11-3631	Shunt
33	11-3790	Rubber wire holder support
34	11-3504	Insulator
35	11-3625	40µF capacitor

5.05 Common Engine Part Numbers

Honda Engines		
	GX620 (A,B,C, Spec.)	**GX 620 K1 (D Spec.)**
Oil Filter	15400-PR3-004	15400-PR3-014
Air Filter Element	17211-ZJ1-003	17210-ZJ1-841
Fuel Filter	16910-ZE8-005	16910-ZE8-015
Fuel Pump	16700-ZJ1-003	16700-ZJ8-003
Fuel Solenoid	16200-ZJ1-003	16200-ZJ1-003
Spark Plug	98079-56846	98079-5585V
Starter Solenoid	35850-ZJ1-811	31204-ZJ1-HO1
Starter Motor	31200-ZJ1-004	31210-ZJ1-811
Voltage Regulator	31710-ZJ1-811	31710-ZJ1-811

kohler engine		
Oil Filter	12 050 01	
Air Filter Pre-cleaner	24 083 03	
Air Filter Element	47 083 03	
Spark Plug	12 132 02	
Fuel Filter	11-3269 (TAI Part)	

ENGINE IDENTIFICATION

Installed in	**Unit Serial Numbers ending with A – C**	**Unit Serial Numbers ending with D**
Engine Type	GX620VXE8	GX620K1VXE8

Model number Identification	
G	General Purpose Engine
X	Over Head Valve
620	20hp
V	Tapered PTO Shaft
X	Oil Alert (shut-down)
E	3A Charge Circuit

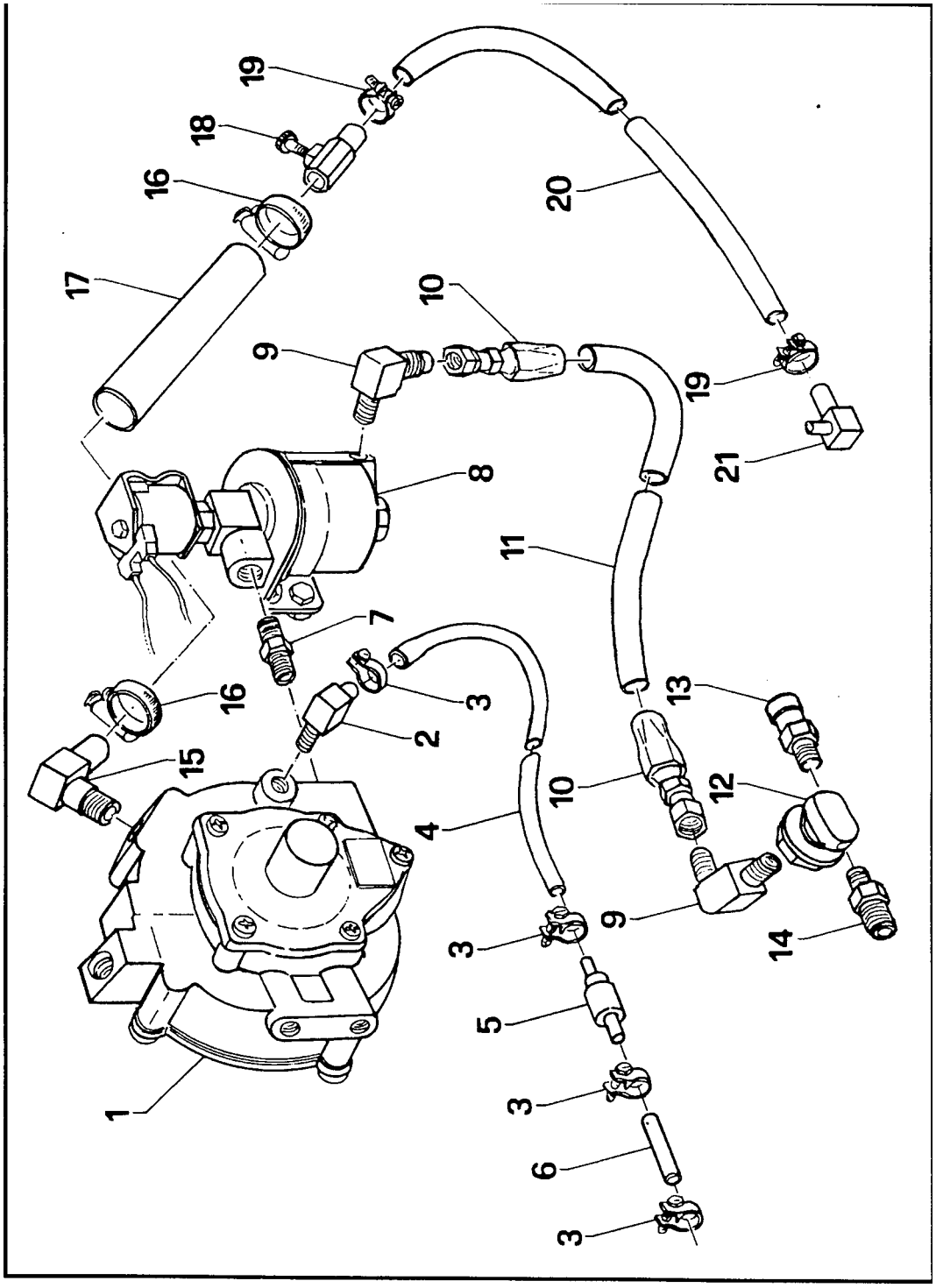
Honda suggested replacement Engine types GX620VXE2 or GX620K1VXE2 with the following differences.
Key type Starting box
Generator style choke
Generator Style Throttle assembly
Red blower housing

MISCELLANEOUS PARTS

Catalog Number	Description
-	Battery 12V/340A Style DT50
11-4033	Engine Fuel Warning label
11-4058	Predator Label
11-4037	Oil Drain Label
11-4035	General Warning Label
11-4039	Battery Warning label
11-4034	Lift Warning Label

5.06 Propane Engine Conversion Parts

Item	Catalog No.	Description
1	11-3556	Regulator propane model Beam T50
2	11-3537	Fitting 90 degree 1/8” NPT x 3/16” hose
3	11-3538	Hose Clamp 8-10 mm
4	11-3539	Hose Vacuum 3/16”
5	11-3560	Check Valve, Vacuum Line
6	11-3561	Hose Vacuum 3/16”
7	11-3562	Fitting 90 degree ¼” NPT x 3/8” SAE Flare
8	11-3563	Electric Lock Off Filter ¼” NPT
9	11-3564	Fitting 90 degree ¼” NPT x 3/8” SAE Flare
10	11-3565	Hose Fitting (High Pressure) straight 3/8”
11	11-3566	High Pressure Hose SAE 100 R5/5/16
12	11-3567	Bullhead fitting 3 x ¼” NPT
13	11-3568	Safety valve ¼” NPT
14	11-3569	Fitting straight ¼” NPT x 3/8” SAE flare
15	11-3570	Fitting 90 degree 3/8” NPT x 5/8” hose
16	11-3571	Hose Clamp 16-25 mm
17	11-3572	Hose 5/8” dry gas
18	11-3573	Main adjustment hse screw 5/8” x 3/8”
19	11-3574	Hose clamp 8-16 mm
20	11-3575	Hose 3/8” dry gas
21	11-3576	Carburetor Propane
22	11-3758	Prime bulb (not shown)
23	11-3760	Hose Clamp 3/16” (not shown)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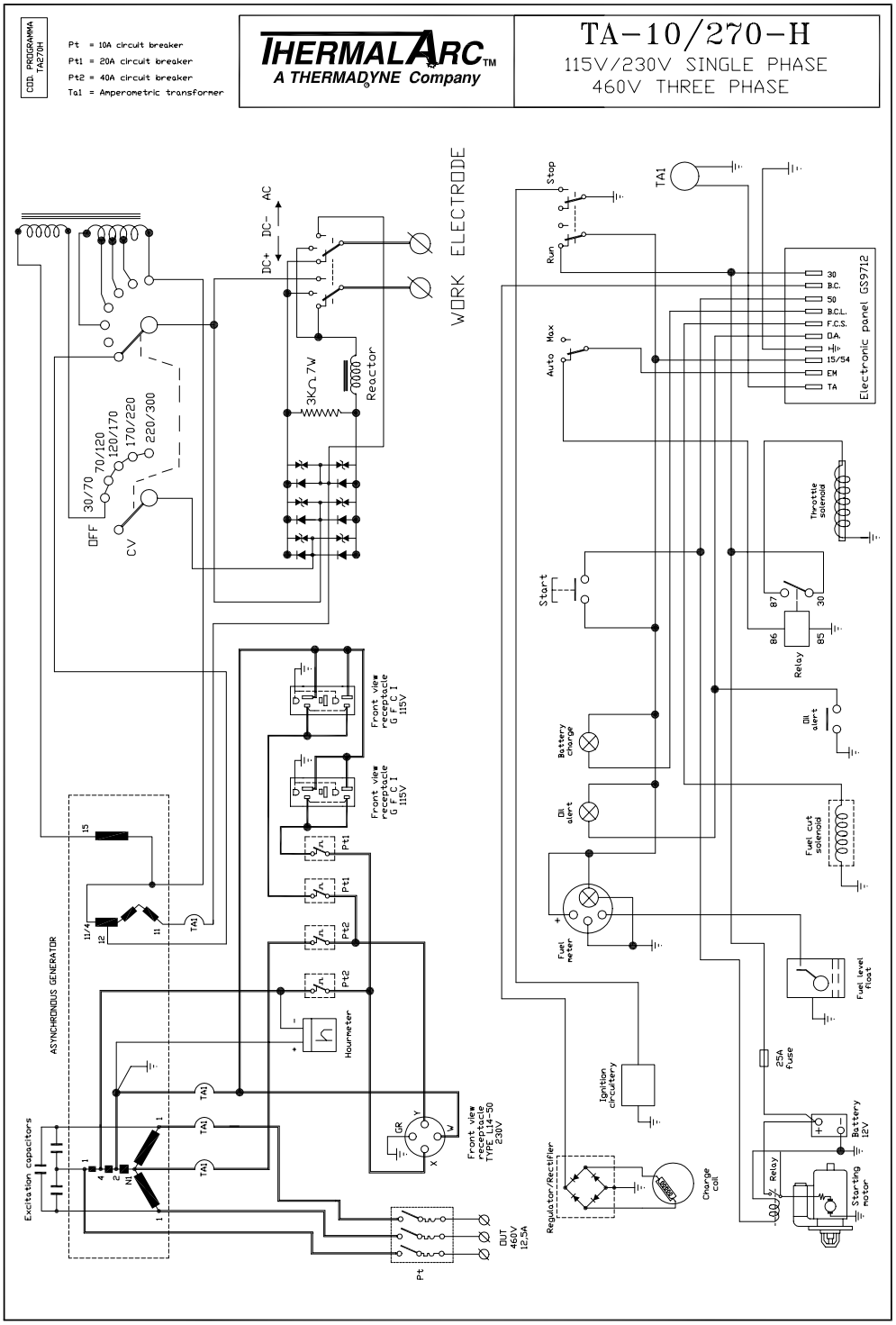
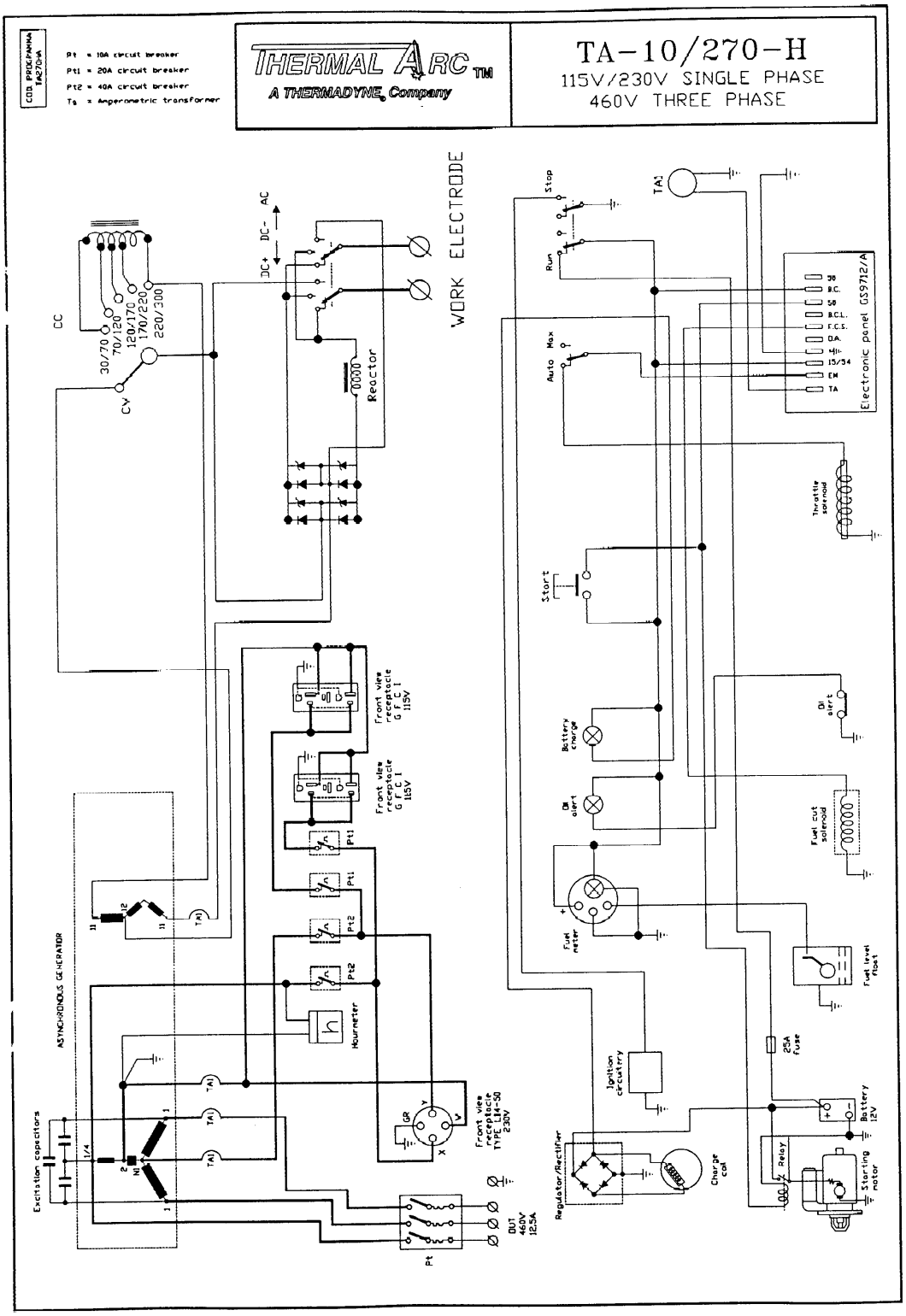
SECTION 6: SCHEMATICS

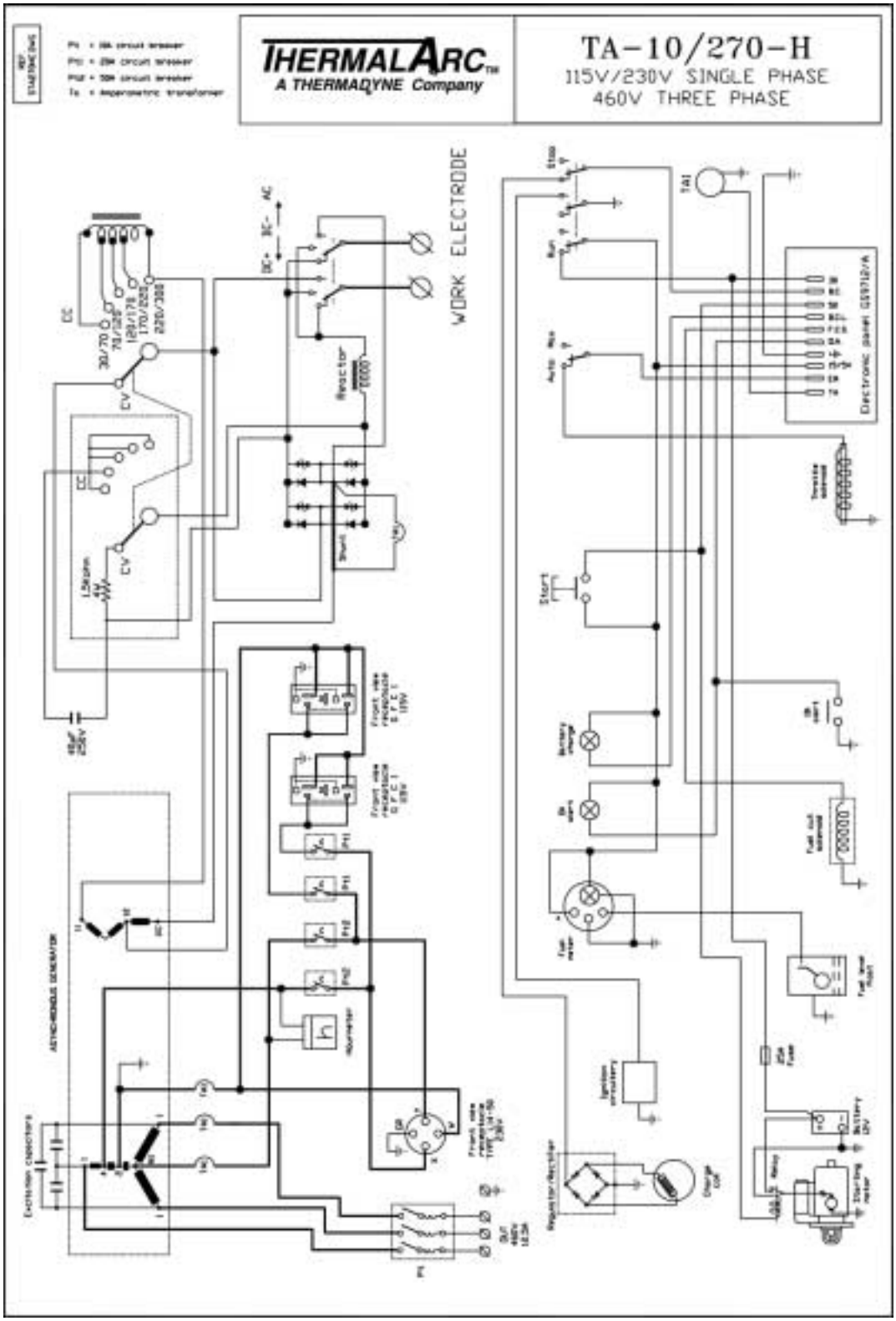
Revision A



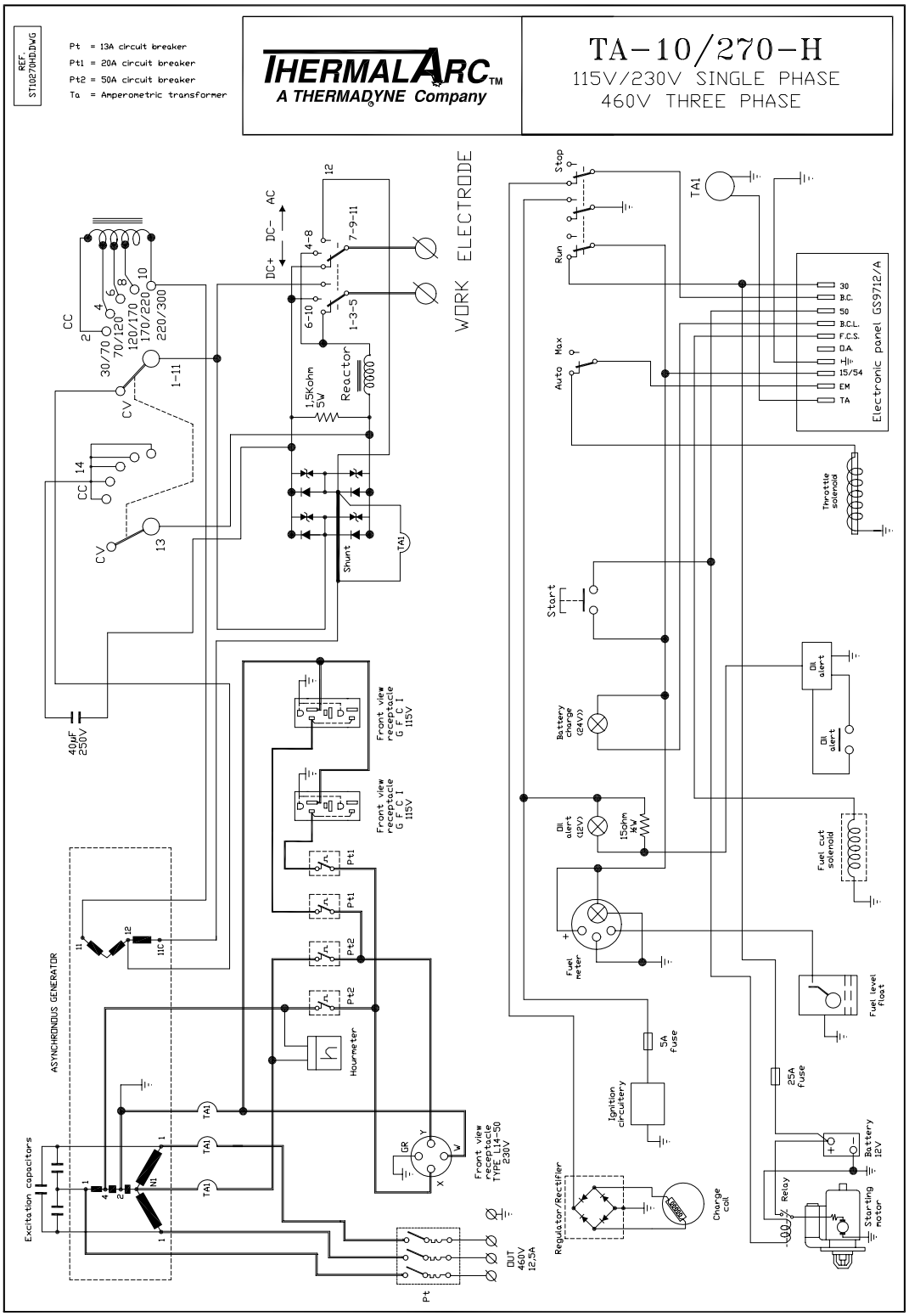
Revision B


TA-10/270-H
115V/230V SINGLE PHASE
460V THREE PHASE
THERMAL ARC TM
A THERMADYNE Company
Pt = 10A circuit breaker
Pt1 = 20A circuit breaker
Pt2 = 40A circuit breaker
Ta = Amperometric transformer
WORK ELECTRODE
DC+ DC- AC
CC
CV
30/70
70/120
120/170
170/220
220/300
Reactor
Stop
Run
Auto Max
TA
Electronic panel GS9712/A
Throttle solenoid
Start
Battery charge
Oil alert
Fuel cut solenoid
Fuel meter
Fuel level float
Hourmeter
Front view receptacle GFCI 115V
Front view receptacle GFCI 115V
Front view receptacle TYPE CS6369 230V
ASYNCHRONOUS GENERATOR
Excitation capacitors
Ignition circuitry
25A fuse
Battery 12V
Regulator/Rectifier
Charge coil
Relay
Starting motor
OUT 460V 12.5A

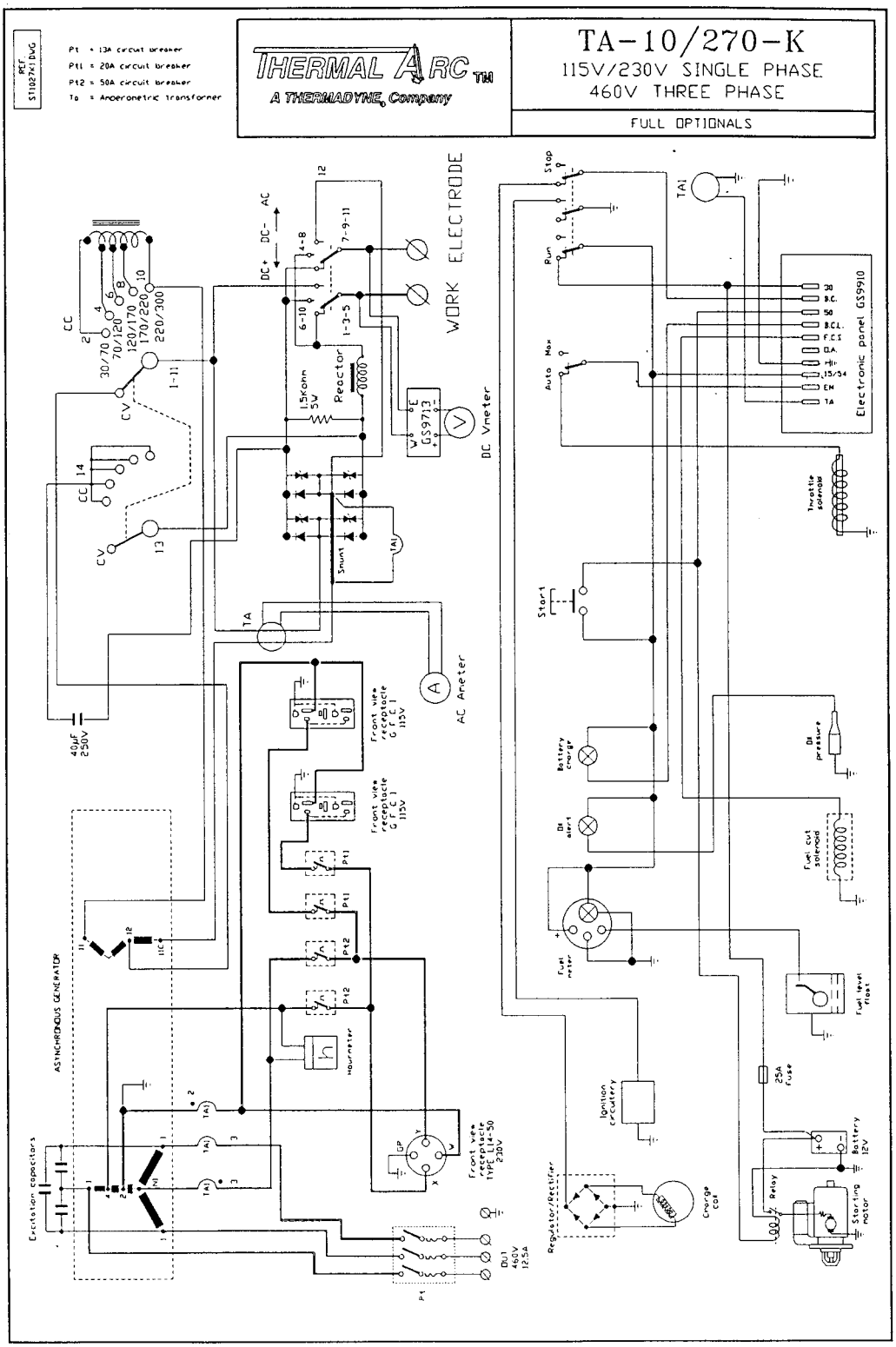
Revision C


THERMALARC
A THERMADYNE Company
TA-10/270-H
115V/230V SINGLE PHASE
460V THREE PHASE
WORK ELECTRODE

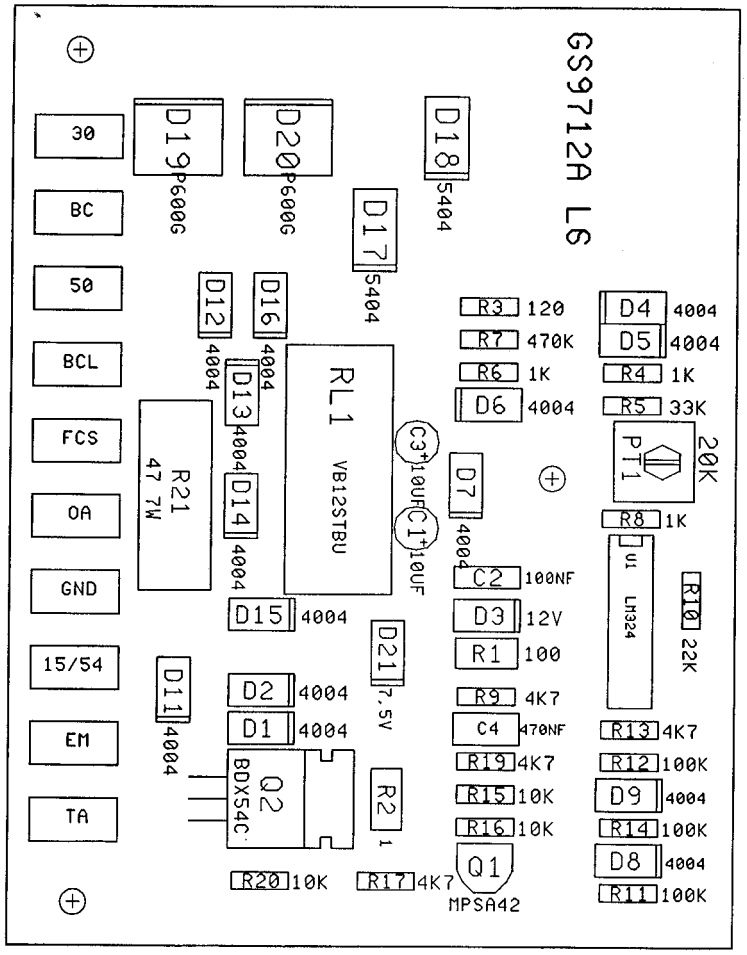
Revision D


REF. ST10270HD.DWG
Pt = 13A circuit breaker
Pt1 = 20A circuit breaker
Pt2 = 50A circuit breaker
Ta = Amperometric transformer
THERMAL ARC TM
A THERMADYNE Company
TA-10/270-H
115V/230V SINGLE PHASE
460V THREE PHASE
WORK ELECTRODE
DC+ DC- AC
CC
CV
Reactor
1.5Kohm 5W
Shunt
40µF 250V
Front view receptacle GFCI 115V
Hourmeter
ASYNCHRONOUS GENERATOR
Excitation capacitors
Front view receptacle TYPE L14-50 230V
DUT 460V 12.5A
Stop
Run
Auto Max
Start
Battery charge (24V)
Oil alert (12V)
150ohm 4W
Fuel meter
Fuel cut solenoid
Fuel level float
Throttle solenoid
Electronic panel GS9712/A
30
B.C.
50
B.C.L.
F.C.S.
O.A.
15/54
EM
TA
5A fuse
25A fuse
Ignition circuitry
Regulator/Rectifier
Charge coil
Battery 12V
Relay
Starting motor

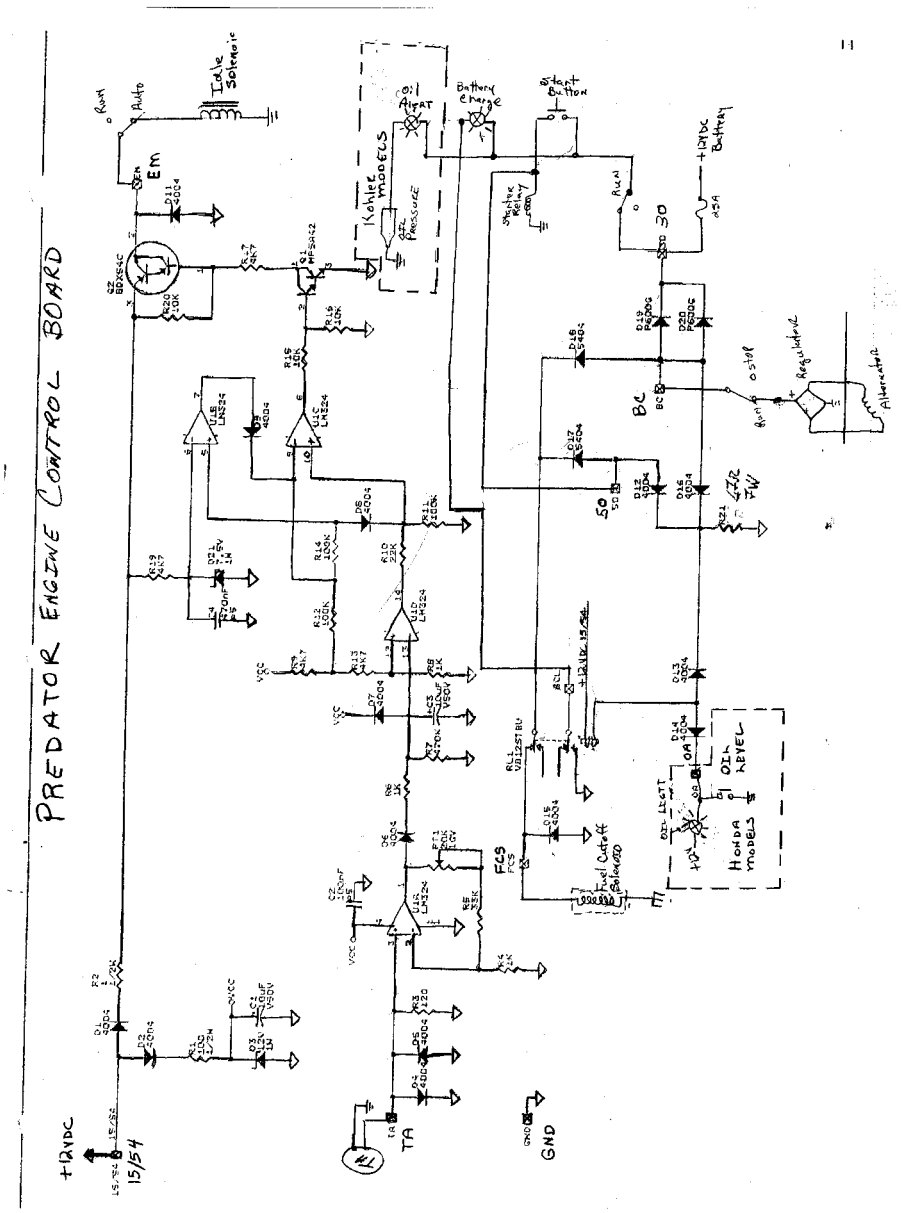
Revision with Kohler Engine



APPENDIX A



Idle control PCBoard



Idle Control PC Board Schematic